**AN EMPIRICAL INVESTIGATION OF USAF
LOGISTICS READINESS OFFICER MISSION
SETS**

THESIS

Matthew D. Roberts, Captain, USAF

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**DEPARTMENT OF THE AIR FORCE
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THESIS

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Matthew D. Roberts, BS

Captain, USAF

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Matthew D. Roberts, BS
Captain, USAF

Approved:

_____   _____
Christian E. Randall, Maj, USAF, PhD (Advisor)   date

_____   _____
Daniel D. Mattioda, Lt Col, USAF, PhD (Reader)   date

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Abstract

Air Force Logistics Officers operate in an evolving and challenging logistics environment which necessitates deliberately growing multi-faceted, interchangeable logistics officers capable of succeeding across all applicable mission sets without sacrificing depth of knowledge. Because of this evolving nature, the knowledge, skills, and abilities (KSAs) needed in these mission sets may have also changed. This study sought to validate the mission sets a logistics officer operates in, identify the critical KSAs needed within each mission set, discover where KSAs overlap, and to determine if the KSAs are being adequately taught to Air Force Logistics Officers. The problem was addressed through qualitative content analysis of personal interviews and focus groups comprised of logistics practitioners in the Air Force. Analysis of the data led to validating the mission sets of Deployment, Distribution, Materiel Management, Life Cycle, and Joint Logistics as the mission sets a Logistics Readiness Officer operates in. These mission sets are comprised of 60 critical KSAs, and 75 percent of the KSAs span multiple mission sets. The Air Force can take advantage of this overlap by consolidating redundant logistics courses that have overlapping KSA content, and by restructuring others to include any KSAs not being taught. Analysis also suggests the Air Force must do a better job educating and training its logisticians in business acumen and process improvement. In doing so, Air Force Logistics Officers will be better equipped to mitigate the effects of the environment and persevere during this challenging time.

To SSgt Emily E. Clayburn, may we be better leaders and learn from your tragic passing.

Acknowledgments

My sincerest gratitude goes to my research partner, Capt Dave Thompson. Without your help, this research effort would not have been successful, and it definitely would not have been as enjoyable. Your attitude and drive are contagious, and for that I thank you.

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Finally, I would like to express my utmost appreciation for my beautiful wife and our amazing daughter. Your sacrifices, understanding, and patience did not go unnoticed, and I am forever indebted to you. Thank you for being my world.

Matthew D. Roberts

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I. Introduction

Background

> "While its mission and purpose are constant, the logistics workforce faces a
> perpetually evolving strategic environment. As the world changes rapidly,
> profoundly, and in every dimension – social, economic, and political – the
> logistics workforce needs to continuously evolve and operate in a way that
> optimizes the human capital of the entire enterprise rather than individual parts."
>> Jack Bell,
>> Under Secretary of Defense for
>> Logistics & Materiel Readiness (2008)

The logistics discipline has been operating in an era of change for several

decades, and both the public and private sectors have embraced this change as an

opportunity to improve human capital investment. We are operating in an environment

of economic instability. One only needs to turn on the news to see that sequestration is a

looming topic of concern. The US Air Force must find a way to operate in a more cost

effective manner. The Chief of Staff of the Air Force acknowledged this in his recently

released Air Force Vision Statement when he said, "Faced with fiscal challenges, we

must make prudent choices to ensure that the Air Force is able to unleash the full

potential of airpower" (Welsh, 2013). In addition to this economic uncertainty, advances

in electronics, globalization, and environmental concerns have all impacted the realm in

which logistics operates, and the field of logistics has had to change as well (Murphy &

Poist, 1991). With logistics now being considered part of supply chain management

instead of a standalone discipline, the knowledge, skills, and abilities (KSAs) of today's

successful logistician are also different than in the past (Murphy & Poist, 2007).

The Department of Defense (DoD) has taken note and in 2008 published the DoD

Logistics Human Capital Strategy. In it, the Under Secretary of Defense for Logistics

and Materiel Readiness added:

> "It is imperative that the logistics workforce align its human capital with transformed warfighting, modernized weapons systems, business rules, emerging enterprise management systems, and executive-level strategic goals. The community should also be grounded in teamwork and collaboration; ultimately, all logisticians across the enterprise would view one another as partners and contributors willing to support each other to achieve mission accomplishment."
> Office of the Secretary of Defense (2008)

The training and education needs of logistics practitioners of each service have been

studied to try and meet these intentions.

Within the Air Force, the Logistics Force Development Division (AF/A4LF) is

responsible for aligning training and education strategy for Logistics Readiness (21R) and

Aircraft Maintenance (21A) Officers with DoD Logistics Human Capital Strategy

objectives. When considering such factors as shrinking numbers of officers, an aging

fleet of aircraft, and operating in an era of heavy fiscal constraints, the A4LF understands

the importance of growing multi-faceted Logistics Readiness and Aircraft Maintenance

Officers capable of meeting the challenges across the entire enterprise of the changing

logistics landscape. To do this, the force development leadership also believes the

logistics practitioners need to follow a deliberate, structured learning process to replace

the haphazard, unstructured process currently in use.

In a 2011 examination of Air Force education and training practices, A4LF

concluded that the current process for developing logistics officers is not deliberate. This

is especially true when DoD-funded logistics courses are taken into account. In 2011, Logistics Officers (21X; inclusive of 21A and 21R career fields) attended more than 200 different DoD-funded logistics courses; 90 of which were funded by the Air Force. A brief review of the courses revealed that many of these courses overlap in content taught and subsequently lead to waste and inefficiencies in Logistics Officer development (Cooper, 2012). A more consolidated course list would be beneficial both due to the current fiscal environment and to help develop a training and education roadmap that can be used to shape tomorrow's Air Force logisticians. However, before an educational process can be developed that maximizes learning effectiveness and efficiencies, one must determine what Logistics Officers need to know in order to be successful multi-faceted logisticians.

One way to address the problem is to break down the functional areas in which Logistics Officers operate into mission sets. Once those mission sets are determined, the critical KSAs needed within those mission sets can be identified. Finally, the mission sets can be analyzed to find overlapping KSAs and courses can be consolidated in order to take advantage of the overlap. Taking this even further, the Air Force can then grow officers with overlapping mission sets from the onset of their careers. This would help meet the DoD Logistics Human Capital Strategy vision of having an "integrated, agile, and high-performing future workforce of multi-faceted, interchangeable logisticians that succeed in a joint operating environment" (Office of the Secretary of Defense, 2008). The goal would not be to combine the 21R and 21A career fields, rather to develop a mutual understanding of the mission needs of each career field through a deliberate

training and education program. A4LF began by proposing the Air Force Logistics

missions for the foreseeable future as <u>mission sets</u> that enable (Cooper, 2012):

- Deployment & Distribution
- Supply Chain Management
- Repair Network Integration
- Mission Generation
- Life Cycle Logistics
- Joint Logistics

Deployment, synonymous with the Contingency Operations core competency of a

Logistics Readiness Officer, and Distribution were presented as a single mission set;

however, Chapter 4 discusses why they were eventually separated into their own mission

sets. For the purpose of this study, the Supply Chain Management mission set was

changed to Materiel Management to properly align itself with 21R terminology.

A4LF then proposed the pyramid structure (Figure 1), which depicts the given

mission sets overlapping with one another. The idea behind the pyramid is that a 21X

officer starts their career by gaining experience in the Deployment & Distribution,

Supply Chain Management, Repair Network Integration, or Mission Generation mission

sets. As the individual progresses from the ranks of Capt to Lt Col, he or she gains more

knowledge and experience in other mission sets and may get assigned to a Life Cycle

Logistics position. Finally, he or she will be better prepared to perform in the Joint

positions as they progress to the rank of Col. The various shades of blue and gray

represent overlap between the mission sets. Historically these mission sets have been

assigned to either the LRO or Aircraft Maintenance Officer, but this pyramid structure

illustrates that the mission sets will no longer be mutually exclusive.
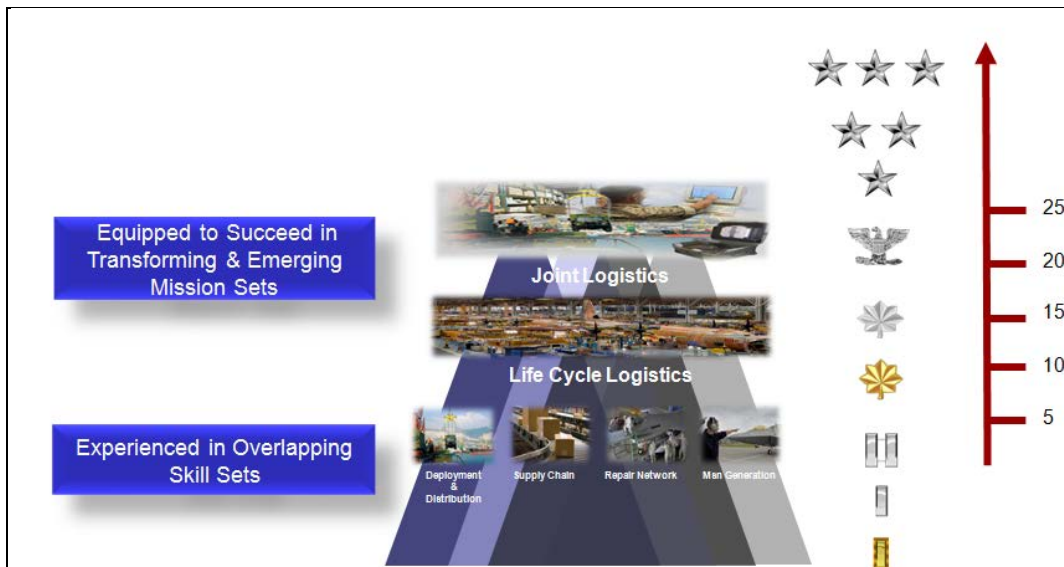
Figure 1: A4LF Proposed Mission Set Pyramid

The 21A and 21R Career Field Education and Training Programs (CFETP)

contain the formal definitions for the first six mission sets, whereas the definition of joint

logistics for this study is taken from the Joint Chiefs of Staff Joint Logistics publication:

> *[Deployment]* **Contingency Operations**. Directs contingency operations such as logistics planning, deployment command and control, Logistics Readiness Centers, logistics command and control, Combat Support Center activities, deployment, bed-down, and redeployment activities. Integrates Agile Combat Support planning efforts, conducts readiness assessment of logistics activities, conducts war and contingency planning, base support and expeditionary site planning, WRM management, support agreement management, manages logistics time phased force deployment data and unit type codes. Enables international theater security cooperation and interoperability, operating in coalition or Joint environments often working with contractors, host-nations, etc.(Department of the Air Force, 2009)

> **Distribution Management**. Directs distribution management operations to include managing cargo distribution functions such as receiving, inspecting, tracing, tracking, packaging, and shipping of supplies, equipment and war readiness spares. Responsible for logistics pipeline management and time-sensitive delivery of materiel in support of peace, contingency, and wartime operations. Maintains accountability for supplies and equipment. Responsible for the safe and efficient organic ground transportation of personnel and cargo within and between installations in support of daily and contingency operations.

Resolves problems related to storage, safety, and fire hazards. Manages storage space utilization and develops and maintains a storage facility and mechanized material handling equipment modernization program to include maintenance, future upgrades, and working stock requirements. Determines readiness requirements, including emergency supply support plans, tactical and strategic movement of personnel, materiel, and units. Schedules and coordinates movement of cargo, personnel, and personal property by commercial or military modes using systems which interface with defense total asset visibility systems. Uses in-transit visibility systems. Maintains liaison with US Transportation Command (USTRANSCOM), other services and federal agencies to schedule and coordinate movements of cargo and personnel. Ensures proper allocation and effective use of transportation resources. Establishes and administers an effective packaging and preservation program. Evaluates movement forecasts and flow of personnel and cargo into the transportation system, movement capabilities, and efficiency of modes used. (Department of the Air Force, 2009)

Materiel Management. Directs materiel management operations such as, direction and management of retail or wholesale supply activities. Included are environmental compliance and inventory management. Determines, computes, and analyzes current and projected materiel requirements; applies authorizations and allowances; establishes and maintains stock levels; manages asset positioning; inspects, reviews, and evaluates work methods and procedures. Ensures accountability is maintained for supplies, equipment, and War Reserve Materiel (WRM). Determines effectiveness of functional data systems. Manages assigned information systems and applies approved standards and criteria to ensure proper implementation, operation, and results. Develops plans, programs, policies and procedures to manage materiel management activities, including systems design and analysis, determination and computation of requirements, plans for activation and inactivation, facility requirements, equipment allowances, and materiel accounting. Develops working capital fund operating programs and determines operating budget. Provides guidance on handling of readiness materiel stocks, including location, type of storage, protection, security, and quality control.(Department of the Air Force, 2009)

Acquisition/*Life Cycle Logistics*. Directs acquisition/life cycle logistics activities. Plans for and manages systems, subsystems, and equipment throughout their life cycle, including integrated logistics support activities and modernization/obsolescence planning. Develops, initiates, integrates, and manages all logistics actions associated with life cycle management of weapon systems, subsystems, and equipment. Serves as logistics focal point throughout the system's life cycle. Formulates logistics management and fiscal policy for weapon systems. (Department of the Air Force, 2009)

Repair network includes off-aircraft maintenance; repairing parts and components, bench testing and checking parts, rebuilding parts, engine repair and

spare utilization, fuel cell and fuel system related repairs, heavy maintenance and inspection functions, and aircraft corrosion control program.(Department of the Air Force, 2009)

Mission generation includes responsibility for on-aircraft maintenance and may include off-aircraft maintenance; preparing aircraft for flight, routine flight line maintenance, refueling operations, towing, servicing hydraulics and oil, and launching and recovering aircraft. Mission generation also includes responsibility for the weekly, monthly, and long-range flying maintenance and training schedules, aircraft utilization, certifying air-worthiness, and monitoring aircraft modifications and retrofit programs. (Department of the Air Force, 2009)

Joint logistics delivers sustained logistic readiness for the combatant commander and subordinate joint force commanders through the integration of national, multinational, Service, and combat support agency capabilities. The integration of these capabilities ensures forces are physically available and properly equipped, at the right place and time, to support the joint force.(Joint Chiefs of Staff, 2008)

Problem statement

Air Force Logistics Officers operate in an evolving and challenging logistics environment which necessitates deliberately growing multi-faceted, interchangeable Logistics Officers capable of succeeding across all mission sets. Because of this evolving nature, the KSAs needed may have also changed. The mission sets an Air Force Logistics Officer operates in must be validated and the critical KSAs of those mission sets must be identified before a deliberate plan can be developed to successfully navigate these challenges.

Research Objectives/Questions

Given the problem, there is a basic need to validate the mission sets that today's Logistics Readiness Officers are expected to perform in. More specifically, the critical knowledge, skills, and abilities (KSAs) required to perform in a given mission set must be identified. To discover which critical KSAs must continue to be taught, and to

discover those which are needed but not available in today's course curricula, this study

investigates the KSAs required by LROs performing in the mission sets of Deployment,

Distribution, Materiel Management, Life Cycle logistics, and Joint Logistics.

Additionally, this research will identify the KSAs that overlap mission sets in order to

identify focused learning opportunities for future 21X courses. To address the objectives

of this thesis, five investigative questions were posed:

1. What are the 21R mission sets?
2. What are the primary KSAs for each mission set?
3. What KSAs overlap multiple mission sets?
4. What KSAs do we currently lack and/or not teach well/at all?
5. What logistics challenges are coming in the foreseeable future and what KSAs are needed to respond to them?

Research Focus

As a contemporary study to that accomplished by Capt Thompson on the

traditional Aircraft Maintenance Officer mission sets and implications (Thompson,

2013), this study's focus is on the traditionally LRO-focused mission sets of Deployment,

Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics. This study

will focus solely on the critical KSAs required to perform successfully in these mission

sets, now and in the near future. This study does not include analysis of or implications

for Munitions Maintenance Officers, nor is it attempting to identify management abilities

traditionally covered in officer Professional Military Education. The sponsor for this

research is AF/A4L, Directorate of Logistics at the Pentagon. They are responsible for

organizing, equipping, training, and ensuring the readiness of 21X officers.

Methodology

Because of the exploratory nature of this research, a multi-method qualitative approach was chosen to address the problem. The researcher, in conjunction with Capt Thompson, utilized both structured focus groups and face-to-face semi-structured interviews as means of data collection. Field-based focus groups were used to discover the critical KSAs required by today's LROs to perform in the different missions sets, and the interview data were collected to help capture "why" certain KSAs were important. Then a combination of conventional and summative content analysis (Hsieh & Shannon, 2005) was performed on the data to discover which KSAs overlapped into multiple mission sets and to identify any potential gaps in training that may exist.

First, the researcher conducted interviews with leaders in the AF Logistics community. These interviews were used to gather expert opinion on which KSAs the 21X officer community currently lacks. Additionally, the interviews were used to discover problems coming in the near future and which KSAs the 21X officer community will need to mitigate these problems.

Next, multiple focus groups were used to generate lists of KSAs for each of the given mission sets. These exercises were conducted at 8 different locations and consisted of 21X officers and civilian equivalents ranging from 2nd Lt to Col. Qualitative content analysis was performed on the data to determine which KSAs were actually needed across the given mission sets and where these KSAs overlapped into other mission sets. Comparisons can be made with Capt Thompson's research to determine which KSAs spanned across both the traditional Aircraft Maintenance and Logistics Readiness Officer mission sets.

Assumptions/Limitations

Because of its exploratory nature, this study lends itself to several underlying assumptions. First, the assumption is made that interviewees have enough relevant experience to provide useful responses and opinions to the questions posed based upon their ranks, time in service, and backgrounds. The second underlying assumption is that the focus group participants provide adequate coverage of the population of Air Force logistics officers. The researcher took steps to ensure representation from each mission set by purposively selecting the locations and individuals involved. The teams consisted of personnel of varying experience levels, time in service, and backgrounds. Although the researcher could not visit overseas locations in the study due to financial constraints, many of the participants have served in overseas and deployed locations. Also, every MAJCOM was represented by at least one team in the study. The researcher assumes this will provide adequate coverage of the entire population of the 21X career fields.

There are also inherent limitations of this research. This study's focus is on the KSAs needed for traditional Logistics Readiness Officer mission sets only. Therefore, the results of this study may not be directly transferable to other United States Air Force career fields or the civilian industry. However, insight may be gleaned that can be useful in analyzing the needs of other career fields. Additionally, time is a critical factor in this study. Because of these time constraints, the researcher was unable to validate the focus group results with a large sample survey. The decision was also made to not include any questions pertaining to when an LRO needs to master a specific KSA. In order to determine this, a follow-up study will have to be performed.

Implications

Results of this study will be used to further enhance A4LF's Logistics Officer development initiatives. The research findings will also be combined with those of Capt Thompson and shared with an Integrated Product Team (IPT) of both 21A and 21R developmental teams (comprised of Colonels who vector officers in each career field) in order to convey the critical KSAs needed by today's 21X officers and to highlight consolidated learning opportunities for 21X officers. The IPT will in turn provide any recommendations based on this study to the Air Force Logistics Board (comprised of the General Officers in the 21X career fields). Using this information, the board can make more effective, fiscally-responsible choices regarding to human capital investment and help ensure officers possess the KSAs necessary to operate in increasingly complex and uncertain environments. These decisions will be codified in future 21X Career Field Education and Training Plans.

In addition to the implications for the logistics practitioners in the military, this study is relevant to researchers interested in evolving human capital needs within logistics and supply chain management. The turbulent nature of logistics is not isolated to the military world, and any understanding gained from identifying new KSAs could be informative to the civilian industry.

II. LITERATURE REVIEW

Overview

This chapter provides a literature review of studies and guidance detailing how civilian and DoD logistics institutions have changed to meet the challenges of the evolving logistics environment. Although no previous research was found that analyzes overlapping KSAs between Logistics Officer mission sets, studies have been conducted on which KSAs logisticians require across the DoD and civilian industry. First, studies detailing the KSAs required in the civilian industry are briefly reviewed. Then the logistics human capital strategy used by the DoD and sister services are explored. Finally, several US Air Force LRO studies are highlighted.

Civilian Industry

The changing logistics landscape not only affects the military, but it also affects the civilian industry. There are numerous studies on the skill requirements for logisticians in the civilian industry, and several are discussed (Gammelgaard & Larson, 2001; Murphy & Poist, 1991; Murphy & Poist, 2007).

In 2001, Gammelgaard and Larson aimed to determine which logistics skills and competencies Supply Chain Management practitioners needed. Gammelgaard and Larson (2001) classified educational requirements into skills and competencies. Skills were defined as general context-independent knowledge such as tools and rules that were taught in most logistics classes, and competencies were defined as context-dependent knowledge that practitioners acquire through experience. They proposed that logistics managers needed a new skill set, and that a substantial change in logistics and supply

chain education was necessary (Gammelgaard & Larson, 2001). A combination of a

survey and case study/interviews were used in their research. To create the skills

included in their survey, the researchers used results from interviews with logistics

executives and skills found in logistics literature. Through the literature review, the

researchers were able to ascertain a growing importance in cross-functional awareness, IT

skills, negotiation, and interpersonal skills. Survey respondents were asked to rate (0 – 9)

the importance of 45 skills for Supply Chain Management. Results of the survey and a

cross case analysis of important skill areas follow.

Table 1: Important Skill Areas for SCM (Gammelgaard & Larson, 2001)

HIGHLY IMPORTANT SKILL AREAS FROM THE SECOND SURVEY

Skill Area	Mean Rating	Minimum	Maximum
Teamwork	7.75	3	9
Problem Solving	7.59	4	9
Supply Chain Awareness	7.59	3	9
Ability to See the "BIG Picture"	7.50	4	9
Listening	7.50	4	9
Speaking/Oral Communication	7.43	5	9
Prioritizing	7.29	3	9
Motivation	7.27	4	9
Cross-functional Awareness	7.25	2	9
Leadership	7.25	4	9
Decision-making	7.16	4	9
Critical Reasoning	7.16	3	9
Writing/Written Communication	7.13	4	9
Time Management	7.07	2	9
Confidence	7.06	3	9
Self-discipline	7.04	3	9
Change Management	7.04	3	9

Importance scale: 0 = none; 1 = very low; 5 = moderate; 9 = very high

Table 2: Cross-Case Analysis of Important Skill Areas for SCM (Gammelgaard & Larson, 2001)

CROSS-CASE ANALYSIS + SURVEY RESULTS						
Skill Area	Case A	Case B	Case C	Case D	Case E	Survey Rank
Gathering & Sharing Information	X	X	X	X	X	
SCM Awareness/"BIG Picture"	X		X		X	3 and 4
Talk to People (oral communication)		X	X	X		6
Listening	X			X		5
Initiating (Managing) Change	X	X				17
Cross-functional Awareness		X	X			9
Project Management		X	X			22
Internal Marketing		X		X		a
Analysis (Problem Solving)		X				2
Knowledge		X	X		X	30,32,33[b]
Systems Development		X		X		42
Facilitation (of meetings)			X	X		36
Motivation				X		8
People Management				X		
Inter-organizational Skills					X	

[a]The survey included "selling," ranked 40th.
[b]Knowledge of newest techniques, latest technology, and the industry, respectively.

The analysis from the survey and case studies showed that the skills Supply Chain Managers need had changed. They are "no longer restricted to the understanding of how to operate a warehouse, etc. They must be managers of the internal as well as the external organization" (Gammelgaard & Larson, 2001). Communication, seeing the big picture, and cross-functional awareness were rated very highly. This theme of cross-functional awareness is seen throughout the studies cited in this chapter. This study's conclusion presented three Supply Chain Management skill areas: interpersonal/managerial basic skills, quantitative/technological skills, and Supply Chain Management core skills. All three broad skill areas are needed to be effective in the Supply Chain Management world (Gammelgaard & Larson, 2001).

A longitudinal assessment of the skill requirements of senior-level logistics executives was conducted by Murphy and Poist from 1991 through 2007. The authors argue that the logistics discipline operates in a changing environment due to factors

including deregulation, economic instability, advances in computers, globalization, and environmental concerns (Murphy & Poist, 1991). Additionally, the logistics discipline itself has undergone dramatic change and together, this meant a change in the nature and scope of the logistician's duties (Murphy & Poist, 2007). They found that earlier research was limited in the number of business, logistics, and management (BLM) skills they included. Therefore, Murphy and Poist (2007) used an updated BLM framework consisting of over 80 skills for this research. The 2007 study used all the skills from the 1991 study and also added new skills that had become prevalent. The skills were identified by reviewing practitioner literature and by having conversations with logistics practitioners. The business skills section consisted of 36 items (33 in 1991), the logistics skills consisted of 18 items and there were 36 management skills (32 in 1991). The study used surveys sent to logistics organizations to assess which skills were now important in today's logistics environment.

Results from the surveys showed that 23/33 business skills now had a higher importance than in the past, 12/18 logistics skills were now more important than in the past, and 25/32 management skills were now more important than in 1991. In contrast, 8 business skills, 6 logistics skills, and 7 management skills were less important than in the past. The largest increase in importance for each BLM category was seen in speech communication (business skills), materials handling (logistics skills), and the ability to assess future opportunities/threats (management skills). The overall rankings (from 1991 and 2007) of the skills follow.

Table 3: Business Skill Rankings (Murphy & Poist, 2001)

Table II Headhunter comparison of senior-level logistics managers – Business skills: rankings

Business skills	1991 study	Current study	Difference (1991 study-current study)
Speech communications	*31*	*13*	*+ 18*
Microecon	11	25.5	− 14.5
Computer science	16.5	30	− 13.5
Production management	*15*	*4*	*+ 11*
Marketing management	18	28	− 10
Human resource management	9	17.5	− 8.5
International business	27	19	+8
Business strategy	4.5	12	− 7.5
General business admin	2	9	− 7
Transport engineer	25	31.5	− 6.5
Insurance and real estate	30	36	− 6
Industrial sociology	26	31.5	− 5.5
Business law	22	27	− 5
Business history	28	33	− 5
Business and government	21	25.5	− 4.5
Quant. methods	12	16	− 4
Info systems mgmt	4.5	8	− 3.5
Regional planning	32	35	− 3.5
Macroecon.	20	23	− 3
Financial mgmt	8	10.5	− 2.5
Public relations	23	20.5	+2.5
Business writing	7	5	+2
Industrial engineer	19	20.5	− 1.5
Procurement	13	14	− 1
Foreign languages	33	34	− 1
Statistics	16.5	17.5	− 1
Transportation and logistics	1	2	− 1
Organizational psych.	14	15	− 1
Accounting	6	6.5	− 0.5
Labor relations	10	10.5	− 0.5
Economic geography	29	29	0
Business and society	24	24	0
Business ethics	3	3	0
Electronic commerce	Not ranked	6.5	
Supply chain management	*Not ranked*	*1*	
Entrepreneurship	Not ranked	22	

Notes: Ordering is from the largest (based on absolute value) to the smallest ranking difference; Italicized indicates skills that are discussed in the text; − signifies that the skill is less important in current study relative to the 1991 study; + signifies that the skill is more important in current study relative to the 1991 study

Table 4: Logistics Skill Rankings (Murphy & Poist, 2001)

Table IV Headhunter comparison of senior-level logistics managers – Knowledge areas within logistics: rankings

Knowledge area	1991 study	Current study	Difference (1991 study-current study)
Materials handling	*5*	*14.5*	*− 9*
International logistics	*16*	*9*	*+ 7*
Forecasting	11	6	+5
Log info management	8	4	+4
Purchasing	12	8	+4
Parts and service support	13	17	− 4
Production scheduling	7	11	− 4
Inventory management	4	1.5	+2.5
Return goods handling	17	14.5	+2.5
Facilities location	10	12	− 2
Transport and traffic mgmt	1	3	− 2
Warehousing management	3	5	− 2
Personnel movement	14	13	+1
Order management	9	10	− 1
Packaging	15	16	− 1
Log-related regulations	6	7	− 1
Customer service	2	1.5	+0.5
Salvage and scrap disposal	18	18	0

Notes: Ordering is from the largest (based on absolute value) to the smallest ranking difference; Italicized indicates skills that are discussed in the text; − signifies that the area is less important in current study relative to the 1991 study; + signifies that the area is more important in current study relative to the 1991 study

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Table 5: Management Skill Rankings (Murphy & Poist, 2001)

Table VI Headhunter comparison of senior-level logistics managers – Managerial and personal characteristics: ranking

Characteristic	1991 study	Current study	Difference (current study-1991 study)
Future threats/opts	28	7	+ 21
Self-confidence	9	21.5	− 12.5
Persuasion	16.5	4.5	+12
Plan	3.5	15	− 11.5
Self-motivation	5	16.5	− 11.5
Managerial control	6	16.5	− 10.5
Organize	3.5	13.5	− 10
Written communication	16.5	7	+9.5
Time management	12	19	−7
Systems concept	18	11	+7
Negotiate	13.5	7	+6.5
Decision making ability	9	2.5	+6.5
Interpersonal relations	15	9.5	+5.5
Personal dress	26	31	−5
Supervise others	9	13.5	−4.5
Outgoing personality	30	34.5	−4.5
Operational log tasks	23	27	−4
Enthusiasm	21	25	−4
Foreign languages	32	36	−4
Computer jock	31	34.5	−3.5
Quant jock	29	32	−3
Statesmanship	27	30	−3
Assertiveness	24	27	−3
Listen and empathize	19	21.5	−2.5
Oral communication	7	4.5	−2.5
Personal grooming	25	27	−2
Train/mentor	20	18	+2
Personal integrity	1	2.5	−1.5
Adapt to change	13.5	12	+1.5
Delegate	11	9.5	+1.5
Analytic reasoning	22	23	−1
Motivate others	2	1	+1
Recruit/hire	Not ranked	24	
Personal creativity	Not ranked	33	
Manage supplier relations	Not ranked	29	
Manage customer relations	Not ranked	20	

Notes: Ordering is from the largest (based on absolute value) to the smallest ranking difference; Italicized indicates skills that are discussed in the text; − signifies that the characteristic is less important in current study relative to the 1991 study; + signifies that the characteristic is more important in current study relative to the 1991 study

An important take away from the research by Murphy and Poist is that they conclude the logistician should be a manager first and logistician second. This does not imply that specialized skills are unimportant, just that they play a complementary role to the overall logistician's duties (Murphy & Poist, 2001). Another important note from this study is that even though there is a lot of overlap between some of the top skills needed in 1991 and 2007, there are some important changes. Information management and oral/written communication skills are rated higher in the latter study than they were before. The skills needed to be a successful logistician are not static, and the implications of this reach farther than just the civilian industry.

Logistics Human Capital Strategy in the Department of Defense and Sister Services

DoD

"The DoD – along with the federal government and USA as a whole – faces myriad challenges in the coming years. Simply put, the future military will require better capabilities at a significantly lower cost."

Office of the Secretary of Defense (2008)

The DoD understood that the logistics environment was changing, and to address the continuously evolving strategic environment, a Logistics Human Capital Strategy (HCS) was published in May of 2008. The goal of the HCS was to "provide a clear vision that establishes the foundation for the future logistics workforce, culture, and human resource practices."(Office of the Secretary of Defense, 2008) To do this, the HCS aims to develop a workforce of multi-faceted, interchangeable logisticians from every service. A core set of competencies and proficiencies would have to be developed to ensure each logistician across the DoD enterprise could be successful in the joint operating environment. These core competencies and proficiencies would be part of training and development roadmap that would build a mix of functional subject matter experts and multi-faceted enterprise-wide logisticians. As a whole, the HCS will enable logisticians to better meet current and emerging mission requirements. (Office of the Secretary of Defense, 2008)

The HCS will depend on six elements, or pillars, to be successful: the logistics career roadmap; logistics competencies and proficiencies; the Logistics Career Development Framework (LCDF); education, training, and developmental assignments; certificate and certification program; and finally an Executive Steering Group. For the purposes of this research, the first three pillars are of particular importance.

The logistics career roadmap (a notional roadmap is depicted in Figure 2) gives visual guidance as to how a logistician would progress throughout their career. The entry level is categorized as Level I and II. Here the logistician is more concerned with their specific branch of service and their own functional area. As they progress to higher levels of competency, they branch out into other functional areas and gain Joint Logistics experience. The intent is to build the right mix of functional subject matter experts and enterprise-wide logisticians. This roadmap is similar to the pyramid (see Figure 1) developed by A4LF. The HCS roadmap introduces four workforce categories (mission sets) that logisticians operate within: Supply Management, Maintenance Support, Deployment/Distribution/Transportation, and Life Cycle Logistics. Additionally, it illustrates Joint Logistics as an area logisticians can gain experience in. Three of these categories, Supply Management, Deployment/Distribution/Transportation, and Life Cycle Logistics are essentially included in the A4LF pyramid. However, the HCS roadmap illustrates that Life Cycle Logistics can start at a career onset, whereas the A4LF pyramid does not. Additionally, the A4LF pyramid includes Joint Logistics as a mission set, whereas the HCS roadmap does not. Another difference is that it is not clear if the HCS workforce category of Maintenance Support includes the mission sets of Mission Generation and Repair Network Integration. One of the purposes of this study is to determine if the pyramid is an accurate representation of what the AF logistician can operate in.
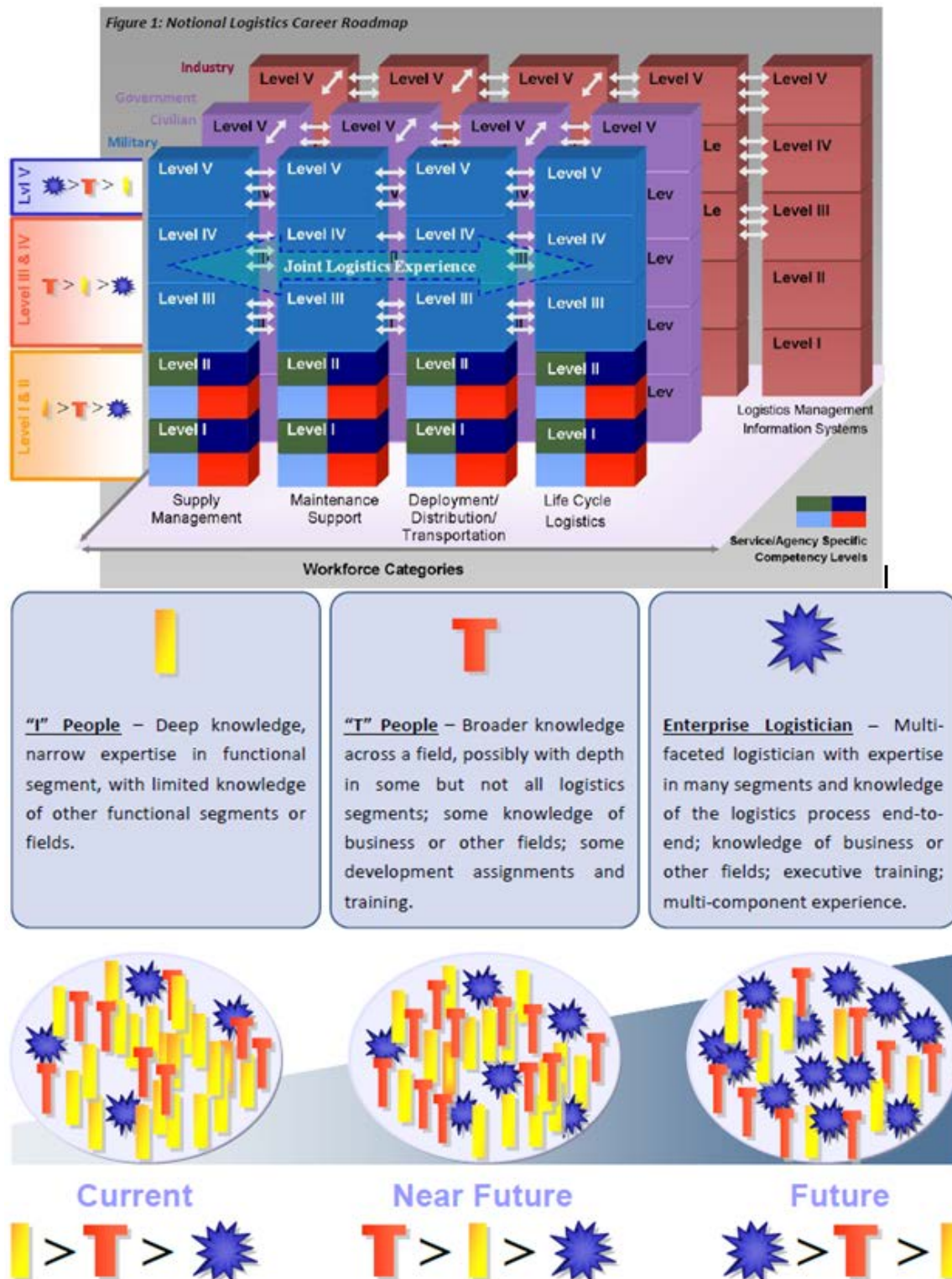
Figure 2: DoD HCS Notional Logistics Career Roadmap (Office of the Secretary of Defense, 2008)

The second HCS pillar is the logistics competencies and proficiencies the logistics workforce needs, which are identified through developing the LCDF. The HCS defines a competency as "a measurable pattern of knowledge, skill, abilities, behaviors, and other characteristics that are needed to successfully perform work-related tasks."(Office of the Secretary of Defense, 2008) The HCS is concerned with three types of competencies: workforce category technical competencies, fundamental competencies, and leadership/management competencies. The competencies are depicted in Figure 3.

The workforce category technical competencies, identified by subject matter experts, are applicable to specific functional areas or mission sets, whereas the fundamental competencies and leadership/management competencies are applicable across all career fields. A logistician would progress through the five levels of proficiency on the career roadmap by demonstrating their proficiency on the competencies. Although mission sets for this study were provided by A4LF, no competencies or KSAs were given.
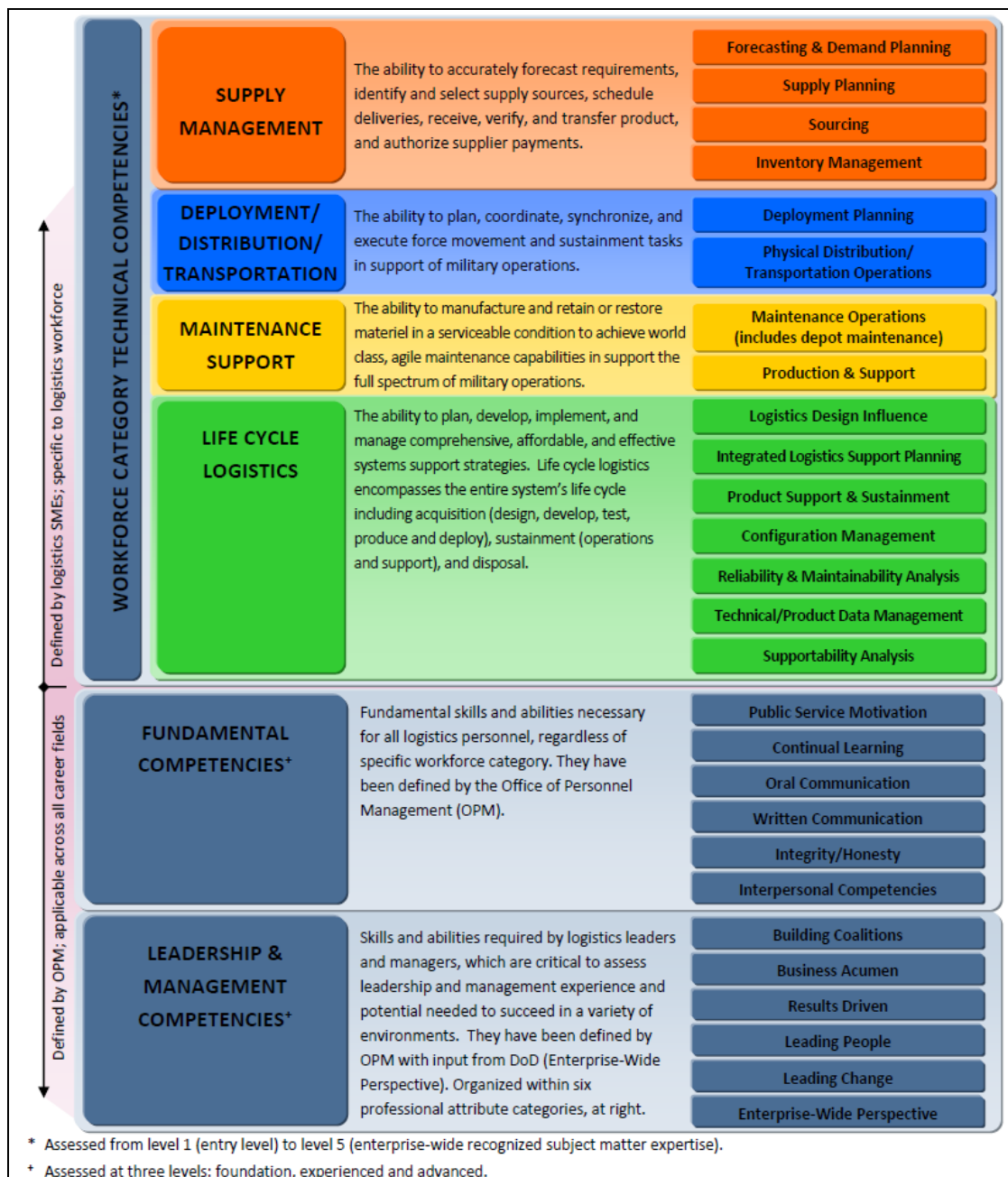
Figure 3: DoD HCS Competencies (Office of the Secretary of Defense, 2008)

The third and final HCS pillar is the LCDF itself. It is a "structured management framework of processes, tools, and strategic guidance used to enable the education, training, and development of the logistics workforce" (Office of the Secretary of Defense,

2008). All services would use the LCDF as a tool to develop their logisticians. It would

also help identify any skill gaps that exist. Since all services would use the LCDF, a

common lexicon would exist between the services. All logisticians would be trained and

educated on the applicable mission set competencies. The proficiency of an individual

would be documented, and easily tracked using the LCDF framework. Both "stove-

piped" and multi-faceted enterprise-wide logisticians would be identified and each could

be utilized according to their skill sets. This in turn would lead to logisticians operating

in the joint environment more successfully.

The HCS illustrates the importance the DoD places on developing its logisticians

to best operate in new environments. The strategy stresses the need for efficient, flexible,

and innovative human capital management. It aims to address the challenges by

developing the right mix of functional subject matter experts and multi-faceted

enterprise-wide logisticians. The notion the DoD has about the changing environment

and needing to adapt our logisticians to be more effective can be seen at the service level

as well, and a brief discussion follows.

Army

In 2008, the Secretary of the Army created the Logistics (LG) Branch comprised

of Quartermaster, Transportation, and Ordnance Officers. The Quartermaster School at

Fort Lee, VA, the Transportation School at Fort Eustis, VA, and the Ordnance School at

Aberdeen Proving Ground, MD were ordered to be consolidated at Fort Lee by 2011.

Fort Lee is where all officers in the Army's LG Branch will are currently trained. The

Army saw the implementation of the LG branch as "not an end state, but rather the latest

milestone in an ongoing evolutionary process to improve how best to sustain our fighting

forces and develop our logistics leader" (Russell, 2012). In Col Russell's Army War College Strategy Research Project titled "The Evolution and Implementation of the Logistics Officer Corps", he highlighted the Army's need for multifunctional logistics officers, how they were created, how they were trained, and recommended improvements. Of particular note is the Combined Logistics Captain's Career Course. Col Russell credits this course with providing timely multifunctional skills and education to logistics captains. All captains from transportation, quartermaster, and ordnance branches must attend this course before they join the LG branch. This is a stark difference from the USAF because 21Rs do not generally remain in one mission set until the rank of Captain. An AF Logistics Officer may move from one mission set to another any time in a career. Although the Army multifunctional skills are not taught until the rank of Captain, Col Russell recommends the Army teach all entry level quartermaster, transportation, and ordnance officers at least a basic understanding of all logistics functions during their Basic Officer Leader Courses. Col Russell's project shows how the Army has adapted to the evolving logistics world by changing the entire logistics structure and notes that it is still a work in progress.

Navy

In 2010, the US Navy released the Supply Corps 2040 Strategic Vision Study. The document updates the Supply Corps mission, vision and strategy, defines core competencies, and highlights new skills that should be developed (Department of the Navy, 2010). Its objective was to "develop a strategic vision positioning the Supply Corps to provide sustained logistics capabilities required to execute the "Cooperative Strategy for 21st Century Seapower" and the "Capstone Concept for Joint Operations"

(Department of the Navy, 2010). The study also acknowledges that Supply Corps officers will operate in a "dynamic environment" that will include operations in humanitarian assistance, disaster relief, and asymmetric warfare which necessitates being able to operate in joint, interagency, and multi-national arenas. The environment is affected by technological enhancements, new operating environments, political pressures, and funding/resource constraints. To help meet these challenges, the study concludes Supply Corps officers will need to be well-versed in Business Management, Financial Management, and Operations Analysis/Research skills as well as leadership and logistics skills. To gain these skills, officer training, education, and experience will have to be reshaped. The study concludes that the future logistics professional must be flexible, must have the skill sets to operate in an increasingly joint environment, must understand logistics from diverse perspectives, and must be exposed to joint concepts earlier in their career (Department of the Navy, 2010). Although the study only gives broad recommendations as to how to meet the objectives, it is important to note that at least the Navy is acknowledging the need to transform its Supply Corps to meet the evolving environment. The Navy also emphasizes the importance of joint operations. However, the Strategic Vision Study does not establish critical KSAs that the Supply Corps Officers will need, nor does it address which KSAs are needed for their individual mission sets.

USAF Logistics Readiness Officer Studies

Multiple studies have investigated logistics training. A more in-depth discussion on several of these studies follows (Hall, 2001; Clark, 2005; Main, 2008; Steyaert, 2009).

In 2001, the Air Force Journal of Logistics published a study by Maj Hall

focusing on the USAF need for an integrated logistics school for the Expeditionary Air

and Space Force. Although the study was performed prior to the 21R career field being

formed, its findings were a relevant precursor to career field being formed and how it was

going to be trained. In particular, Maj Hall sought to find if there was a gap in

interdisciplinary logistics employment and sustainment training by posing the following

three questions: (1) Do we have an integrated logistics officer training?, (2) Do we need

it?, and (3) How do we get it? A combination of personal interviews with doctrine

subject matter experts and a survey administered to a cross section of logistics officers (to

include then Logistics Plans Officers, Transportation Officers, Supply Officers,

Contracting Officers, and Aircraft Maintenance Officers) was used to answer the

researcher's questions (Hall, 2001).

Maj Hall used this 1985 quote from then Lt Gen Leo Marquez to highlight the

importance of changing the USAF's logisticians:

> "Tomorrow's logistician must have a much better, more complete understanding
> of the entire flow of our logistics process. No longer can we afford to build
> discrete specialists in maintenance, or munitions, or supply, or transportation." Lt
> Gen Marquez as quoted by Hall (2001)

Maj Hall (2001) found statistical correlations between key aspects of the logistics career

field and concluded there was an absence of integrated training. The first significant

correlation discussed by Maj Hall (2001) was at the $\alpha = .05$ level (.432, n=41) and was

between "cross-functional logistics duties" and "having to learn on the job in a deployed

location." These results suggested that members deploying to integrated logistics jobs

did not have adequate training prior to deploying. Instead, comments received stated the

individuals were "baptized by fire" and had to learn on the job. This goes hand-in-hand with the next significant correlation he found in the research between "adequately trained to perform deployed duties" and "having to learn on the job in a deployed location", which was significant at the .05 level (.446, n=38). Maj Hall concluded that these results point to the need for cross-functional expertise and training at a level greater than just familiarization (Hall, 2001).

Hall's (2001) research also found statistical correlations for the need of an integrated logistics officer training. A correlation existed between "deployed cross-functional logistics duties" and "the Air Force should better prepare officers for cross-functional senior logistics positions" at the .05 level (.564, n=41). Additionally, there was a significant correlation between "having to learn on the job in a deployed location" and "attendance at an expert level school would better prepare me to perform duties in the AOR", however the significance level was not included in the report. This pointed to the need for integrated logistics officer training. Hall (2001) concluded that junior officers are already performing in cross-functional roles in deployed environments and that this is a reason for the results.

Hall's (2001) study found a significant correlation pointing to how we can get integrated logistics officer training. The correlation existed between "at selective expert-level, cross-functional schools would provide a better career path," and "attendance at an expert-level course would better prepare officers for integrated senior level responsibilities", and this was significant at the .05 level (.405, n=35). One of the comments on possible courses of action the USAF could take to provide integrated logistics officer training was "need a formal, in-residence course providing in-depth

analysis of the operational tenets of all logistics disciplines, with focus on the interrelationships among each discipline as well as core responsibilities associated with the student's future level of responsibility." A cross-functional logistics officer training course was also one of the recommendations proposed in the study (Hall, 2001).

As previously stated, Hall's (2001) study was conducted prior to the creation of the LRO career field. However in 2002, not long after this study, the USAF formed the LRO career field by combining the Logistics Plans, Supply, and Transportation Officer career fields, and a combined technical training school was implemented for entry level LROs to attend. However, this did not include any teachings on where the mission sets overlap. Several Air Force papers and studies were conducted after the implementation of the LRO career field that focused on the effectiveness of the training that was being provided (Clark, 2005; Main, 2008; Steyaert, 2009).

In Maj Clark's (2005) Advanced Logistics Readiness Officer Course (ALROC) paper titled "Effectiveness of Logistics Readiness Officer Training for Expeditionary & Joint Environments", he attempts to discern if LROs (senior company grade to field grade officer level), are receiving the tools and skill sets needed to be effective in the joint and expeditionary environments. A literature review and survey were used to address the questions in his research. From the survey data, Clark (2005) concluded that respondents felt they were being adequately trained in Air Force Agile Combat Support doctrine, but they were not confident in Joint or sister service doctrine. The respondents were overwhelmingly in support of training entry-level LROs on Joint and sister service logistics doctrine and logistics structures. Clark (2005) concluded that this meant that Air Force logistics officers were lacking in this training, or that joint and sister service

training just was not happening early enough in an LRO's career. Additionally, he goes

on to say that his survey points to respondents being more comfortable with the training

they receive for expeditionary environments than for Joint environments (Clark, 2005).

This coincides with the finding that 49.1 percent of respondents reported that they had

experienced a significant learning curve in order to perform effectively in a Joint

environment. From these findings, Clark (2005) concluded that radical changes were

required in the way the Air Force was training LROs. He suggested the Air Force teach

Joint Logistics, to include an overview of sister services, in the LRO technical school in

order for entry level LROs to better understand that environment. He also recommended

the Air Force develop an intermediate-level, in-residence LRO Captain's Course that also

emphasizes Joint doctrine and logistics concepts. This course would be mandatory for all

Captains, and it would also be mandatory prior to deploying to any position that would

deal extensively with a sister service (Clark, 2005). Although Clark's paper concludes

that the way we train needs to be changed and that the training needs to include Joint and

sister service material, the study does not indicate which KSAs need to be taught.

One study that addresses the KSAs an LRO needs to know was conducted by

Capt Main (2008) at the Air Force Institute of Technology (AFIT). More specifically,

his thesis "sought to determine which analytical skills are useful for Logistics Readiness

Officers, as reported by active-duty LROs in grades O1-O5 and their supervisors" (Main,

2008: iv). Main (2008) conducted this research in response to information technology

changes which seemed on the horizon. The Air Force was in the midst of developing the

Expeditionary Combat Support System (ECSS), an enterprise resource planning system

that was to be used by Air Force logisticians. ECSS was slated to be implemented in

2010, and it would replace many of the legacy information technology systems currently in use throughout the logistics complex. Main (2008) used a literature review and survey instruments to conduct this research. From the research, Capt Main (2008) concluded that Descriptive Statistics, Graphical Statistics, and Forecasting were the most important analytical techniques LROs believed they would need to conduct their duties. However, Capt Main noted that there was no adequate quantitative-based training available to teach forecasting techniques to all LROs at that time. He went on to suggest that a forecasting training course could be developed and made available to LROs through AFIT or the Defense Acquisition University. Although this study focused on analytical techniques LROs would need to know, it was narrowly focused when considering the multi-faceted logistician. Main's (2008) thesis did not discuss any other skills that would be required of LROs across their mission sets, nor did he address any other overlap between them.

Another study that addressed the development of LROs was performed by Maj Steyaert (2009) for his Graduate Research Project at AFIT. Steyaert sought to determine if the current LRO core competency training program produced qualified LROs in Air Combat Command (ACC) or if LROs had been generalized too much and adversely impacted their expertise levels (Steyaert, 2009). The researcher used a Delphi study to answer the questions, "What is your definition of a qualified LRO", "What challenges prevent, or impede, LROs from completing core competency training", and "List the critical functional skills you believe are required for an LRO to be considered qualified". This Delphi panel of experts defined a qualified LRO as "one who has a competent understanding and knowledge of the three core competencies (materiel management, distribution management, and contingency operations), has completed all required

30

CFETP training tasks and has all SEIs" (Steyaert, 2009). They also concluded that deployment commitments were the largest impediment to LROs becoming qualified. Finally, they listed the top critical functional skills of an LRO (Figure 4).

Question 3: In your opinion, what are the critical functional skills required of a "qualified" LRO?	
1	IDO experience, deployment operations, TPFDD management, support planning (IGESP/beddown)
2	Leadership
3	Supply management, WRM management, warehouse management, HAZMAT
4	Briefing and analytical skills
5	Aerial port operations, cargo movement, load planning, TMO
6	Fuels management
7	Understands logistics information systems (SBSS, DCAPES, GDSS, GATES, LOGMOD, OLVIMS, etc…)
8	Vehicle management and vehicle operations (including convoy operations)
9	Manage squadron ART and SORTS programs
10	Administrative experience (awards, decorations, performance reports, budget, discipline issues, enlisted promotion system)

Figure 4: Top Critical Functional Skills of an LRO (Steyaert, 2009)

This list is rank-ordered by the importance bestowed on each skill by the Delphi panel. Although this study addressed the concerns of what it means to be a qualified LRO and what the critical skills of a qualified LRO are, it does not address separate mission sets. Nor does this study discuss KSAs that may overlap into several mission sets and how to take advantage of them.

Summary

The literature reviewed in this chapter emphasizes the changing environment in which logisticians operate. This change effects logisticians across the DoD, sister services, the US Air Force, and the civilian industry. Many studies have been performed

to see how logisticians and/or organizations can change in order to be successful in the face of these challenges. Studies suggest reorganizing some organizations, and some suggest finding new ways to train logisticians altogether. An underlying theme is that today's logistician needs to be multi-faceted in order to be successful. Yet the previous research has not identified which skill sets or KSAs overlap into multiple mission sets. This study will be different in that it will not only identify the critical KSAs an AF logistician needs in order to be successful in a particular mission set, but it will analyze the overlapping KSAs between the mission sets. This will give a clearer picture as to opportunities that may exist to take advantage of this overlap to build a multi-faceted logistician in the Air Force.

III. Methodology

Overview

The purpose of this chapter is to outline the methods used in this study. First, a description of the procedures used and why they were chosen will be given. A combination of semi-structured personal interviews and semi-structured focus groups were used to address the investigative questions. Next, the locations chosen and participants of the study will be discussed. Finally, an overview of the methods of analysis rounds out this chapter.

Procedures

A combination of semi-structured personnel interviews and structured focus groups conducted at ten different locations were used to address the five investigative questions.

Although no study was found that examines overlap in the KSAs needed by 21X officers, several studies were applicable to the investigative questions posed and their methods were referenced. For instance, Murphy and Poist (2007) researched the skill requirements of senior level logisticians and used an "empirically validated framework that consisted of over 80 distinct skills and knowledge areas" (Murphy & Poist, 2007). These skills and knowledge areas are known as the BLM framework, and they were formed from prior research and by gathering inputs from logistic practitioners. One of the goals of the current study is to identify the knowledge, skills, and abilities needed by 21X officers. Therefore, inputs were solicited from current logistics practitioners in the United States Air Force. Additionally, both interviewees and focus group participants

were given a copy of the knowledge, business skills, and management abilities list used by Murphy and Poist (1991, 2007) as a reference point (Tables 3 – 5). The participants were informed that the intent was to develop an Air Force specific list of KSAs.

To gather inputs, focus groups consisting of 21X officers and civilian logistics personnel were conducted. Focus groups are a "research technique that collects data through group interaction on a topic determined by the researcher" and have become a popular qualitative method used in conjunction with personal interviews (Morgan, 1996). Research suggests several reasons for using focus groups. Focus groups are an appropriate method to use when the participants are lower in the power hierarchy than the decision makers of an organization because it allows peers to freely and safely share their opinions. It can bring about points of views vastly different than those of the decision makers. Another reason to use focus groups is when one needs a friendly and respectful research method. Unlike surveys, focus groups allow the moderator to form a rapport and an atmosphere of trust with the participants. The trust and friendly atmosphere in turn can lead to more honest and meaningful information (Morgan, 1993). According to Goldman (1962), focus groups also have the advantage of discovering new ideas that individual interviews would not have found, and these ideas can evolve throughout the session. These criteria were a good fit for this research. This research's sponsor, A4LF, was particularly interested in what base-level logisticians believed to be important. A4LF felt that they and other staff may be too far removed from the day-to-day happenings of today's AF logistician. The focus group method allowed the researcher to gain the base-level logistician's insights, and it provided a forum to build a relationship with the participants.

Although no concrete rules exist on how one must conduct focus groups, there are general guidelines. The groups should be small in nature, and they should be fairly homogenous in order to promote idea sharing (Morgan, 1993). The session should last approximately 60 – 90 minutes and should consist of around 5 to 10 main questions. In structured focus groups, the same format must be used across groups in order to allow for comparisons to be made (Morgan, 1993).

The data collection effort consisted of 40 focus groups spread across 9 locations. The groups were homogenous in nature (teams were assigned by organization made up of 21X officers and civilians at each location). The researcher and a contemporary served as the moderators for the focus groups. These focus groups were used to generate the list of KSAs needed in each mission set by 21X officers. Each focus group session started off with a background explaining what the goals of the research was, why the research was being performed, and an explanation of what was needed. Each individual team member was encouraged to share their thoughts in order to generate as many potential KSAs as possible. Additionally, the team members were encouraged to ask questions to clarify any part of the session they may not understand.

To help capture more in-depth thoughts on the investigative questions, face-to-face semi-structured interviews were also conducted. These interviews permit the subjects to explain not only what the 21X career field needs, but why they need it. The interview method was also chosen because it allows ambiguous answers to be clarified if needed and follow-up questions could be asked on any pertinent subject. The interview method allows the researcher to establish a relationship with the interviewees and helps

gain their cooperation (Leedy & Ormrod, 2010). A brief discussion of how each investigative question was answers follows.

To address the first investigative question, what are the AFSC-specific mission sets, the interviewees were asked to validate the mission sets proposed by A4LF. Additionally, each focus group team was asked if the mission sets were accurate, and if any mission set was left out of the model.

This study addressed the second investigative question, what are the primary KSAs for each mission set, by holding focus group sessions in the aforementioned locations. Each group was given a KSA development worksheet to fill out, and were tasked with listing the KSAs they felt were important for each mission set. Additionally, they were asked to identify any KSAs they felt were not taught well enough or at all. Each team was able to list KSAs for any of the seven mission sets, regardless if they had experience in that area or not. The focus groups were not limited in the amount of KSAs they could identify for each mission set. Each was given extra paper to allow for overflow. A sample KSA development worksheet follows.

KSAs Development Worksheet   Date_____

A	B	C	D	E
Deployment	Distribution	Materiel Management	Repair Network Integration	Mission Generation

F	G
Life Cycle Logistics	Joint Logistics

Team's Unit

| Team member: Name, Rank	Mission Set Experience
1	A-B-C-D-E-F-G
2	A-B-C-D-E-F-G
3	A-B-C-D-E-F-G
4	A-B-C-D-E-F-G
5	A-B-C-D-E-F-G
6	A-B-C-D-E-F-G
7	A-B-C-D-E-F-G
8	A-B-C-D-E-F-G
9	A-B-C-D-E-F-G
10	A-B-C-D-E-F-G

Figure 5: KSA Development Worksheet

Once all the focus groups were complete, a panel of four logistics experts independently analyzed the results in order to categorize homogenous responses into parent KSAs. The panel consisted of the researcher, two 21A officers, and a 21R officer. The panel came together after each member completed their analysis and compared results in order to validate the findings. The panel did reach consensus before further analysis was performed on the data. Additionally, the results were analyzed to discern if more focus groups would be required. Because no new KSAs were revealed by groups at the last location, it was determined that information saturation was achieved and no more data would need to be gathered.

The third investigative question, what KSAs overlap into multiple mission sets, was addressed by performing a cross-team analysis of the results found for question three (all inputs from focus groups were compared). The parent KSAs were clustered into regions that span multiple mission sets in order to visualize all the KSAs that occur in a

given region. These clusters enable the discovery of the overlapping KSAs within the mission sets.

This study addressed the fourth investigative question, what KSAs do we currently lack and/or not teach well or at all, by using a combination of interview and focus group data. The team members were instructed to identify any KSAs they listed on their KSA development worksheet that they felt were not taught well enough or at all. Each interviewee was asked:

> *What knowledge, skills, and abilities do we lack in the 21R world that we need today? Why?*

All of the responses from the interviewees and focus groups were analyzed to find commonalities and differences

The final investigative question, what problems are coming in the foreseeable future and what KSAs are needed to respond to them, was addressed by using feedback during the interviews. Once again, the responses were analyzed to find common themes. Each of the interviewees was asked:

> *What knowledge, skills, and abilities will the 21R community need in the next 5 years that there is not a developed need for today? Why?*

Locations

The 10 locations were purposely selected based on the missions each location performed. The intent was to gather information from members across the proposed mission sets of Deployment and Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics. In order to achieve this goal, interviews and/or focus group sessions were conducted at Sheppard Air Force Base, Joint Base Charleston, Joint

Base Langley-Eustis, Joint Base McGuire-Dix-Lakehurst, Scott Air Force Base, Tinker
Air Force Base, Wright Patterson Air Force Base, the Pentagon, Defense Logistics
Agency Headquarters at Fort Belvoir, and the Army Logistics University in Fort Lee,
Virginia. These locations ensured adequate coverage of the mission sets from mobility,
combat, and lifecycle perspectives. Table 6 details which mission sets were keyed on for
each visit. Though a mission set may not be marked for a particular location, it does not
necessarily mean it was not discussed there. For instance, even though JB Charleston
does not have Materiel Management marked, it was still discussed there. Early
interviews and focus groups necessitated the split of deployment and distribution into two
separate mission sets. This will be discussed in more detail in Ch 4.

Table 6: Interview/Focus Group Locations (*focus groups only; **interviews only)

Location	Deployment	Distribution	Materiel Management	LCL	Joint Log
U&TW (Sheppard AFB)*				X	
JB Charleston	X	X			X
JB Langley-Eustis	X		X		X
JB McGuire-Dix-Lakehurst	X	X			X
Scott AFB		X	X		X
Tinker AFB			X	X	X
Wright Patterson AFB**				X	
Pentagon					X
DLA HQ Ft Belvoir			X		X
ALU Ft Lee **					X

Participants

This research aimed to gather insights into the education and training needs of the
population of 21X logistics officers. To do this, the sample of participants was
purposively selected to provide adequate coverage of the entire 21X population. This

method is backed by Trochim (1989) when he stated, "Our experience has been that a conceptualization is best when it includes a wide variety of relevant people" (Trochim, 1989). To achieve this during the interview portion of the research, a total of 42 21X officers and civilians were interviewed across the different locations. The military interviewees ranged from the rank of Major through Lieutenant General and held positions of leadership in their respective organizations. A breakdown of the AFSC and ranks are provided in Table 7.

Table 7: AFSC/Rank of Interviewed Personnel

AFSC	Rank	Number
21A/M	Maj	3
21A/M	Lt Col	3
21A/M	Col	7
21A/M	Brig Gen	2
21A/M	Maj Gen	1
21A/M	Lt Gen	1
21A/M	Civilian	4
21R	Maj	3
21R	Lt Col	4
21R	Col	11
21R	Civilian	3

In order to achieve this variety for the focus groups, a total of 40 teams comprised of 126 logistics practitioners were formed across 9 locations. These teams consisted of 72 21A/M and 54 21R officers ranging in rank from Lieutenants to Colonels and civilian equivalents. The 40 teams were functional in nature and spanned across all 7 mission sets. Of the 21Rs, 79.6 percent reported they had Deployment experience, 85.2 percent had Distribution experience, 68.5 percent had Materiel Management experience, 33.3 percent had Life Cycle Logistics experience, and 74.1 percent had Joint experience. Of the 72 21A/Ms, 61.1 percent reported they had Deployment experience, 19.4 percent had

Distribution experience, 33.3 percent had Materiel Management experience, 33.3 percent

had Life Cycle Logistics experience, and 23.6 percent had Joint experience. There were

15 teams comprised solely of 21R officers/civilians, 23 teams comprised solely of 21A

officers/civilians, and 2 teams that were a mixture of 21A and 21Rs. The difference in

number of participating 21As and 21Rs is attributed to including the 21A Utilization and

Training Workshop focus groups at Sheppard AFB. These groups included 32 personnel,

and all were 21A officers and civilians. The AFSC and Ranks of the participants are

broken down by location in Tables 8 and 9.

Table 8: 21R Focus Group Participants

21R Participants						
Installation	Lt	Capt	Maj	Lt Col	Col	Civ
JB Langley-Eustis		2	3	1		1
Pentagon			1	1		
DLA HQ Ft Belvoir		2		4	4	
JB MDL	4	1	1			1
Scott AFB		2	6			1
Tinker AFB		2	1			5
JB Charleston	4	3	2	2		
21A U&TW Sheppard AFB						

Table 9: 21A Focus Group Participants

21A Participants						
Installation	Lt	Capt	Maj	Lt Col	Col	Civ
JB Langley-Eustis				1		
Pentagon				2		
DLA HQ Ft Belvoir					1	
JB MDL	3	2	4	1		
Scott AFB	2	1	1		1	
Tinker AFB	2	1	3	2		
JB Charleston	4	2	2	1		
21A U&TW Sheppard AFB		1	10	8	11	2
Wright Patterson AFB		1	1		1	1

Methods

Qualitative content analysis was used to analyze the data collected from the focus groups and interviews. As defined by Hsieh and Shannon (2005), qualitative content analysis is a "research method for the subjective interpretation of the context of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005: 1278). The three types of qualitative content analysis discussed in the article were conventional, directed, and summative content analysis. In conventional content analysis, researchers allow new insights to emerge from the data vice having preconceived notions of what the coding categories should be. This method lends itself well to open-ended interviews (Hsieh & Shannon, 2005). Directed content analysis differs in that the researcher begins with codes already in use but refines the coding scheme as the research develops (Hsieh & Shannon, 2005). Summative content analysis starts with identifying and counting words, but then it goes further. "The summative approach to qualitative content analysis goes beyond mere word counts to include latent content analysis. Latent content analysis refers to the process of interpretation of content. In this analysis, the focus is on discovering underlying meanings of the words or the content" (Hsieh & Shannon, 2005: 1283 - 1284). Conventional content analysis was used to analyze data from the personal interviews. More specifically, the interviews were analyzed to find common answers and themes amongst them, and then frequencies and percentages of answers were calculated for each of the applicable investigative questions. Both directed and summative content analysis was utilized for focus group data. The information from the KSA Development Worksheets were compiled and analyzed. Once a consensus on grouping homogenous

KSAs into parent KSAs was achieved by the panel of logistics experts, the results were analyzed to determine which KSAs were needed within each mission set by utilizing frequencies. Then each mission set was further analyzed to discover which KSAs overlapped into multiple mission sets.

IV. RESULTS AND ANALYSIS

Overview

This chapter summarizes the results found from the data analysis. Each investigative question is addressed in the order it was presented. As mentioned in Chapter 1, this study addressed six investigative questions.

Investigative Question #1: What are the 21R mission sets?

It is important to note that the interview protocol did not initially contain any question regarding the accuracy of the proposed pyramid model (Figure 1). However, several interviewees questioned its validity early on in the research. Because of this, all subsequent interviewees were asked their thoughts on the mission sets and pyramid proposed by A4LF. The general consensus among the interviewees was that the listed mission sets of Deployment & Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics are the primary skill sets that a 21R officer performs duties in. However, several changes were proposed and implemented.

First, during the initial interviews, Deployment and Distribution were thought to be different enough to be their own mission sets. According to interviewees, the complexity and scope of both Deployment and Distribution would be better addressed if they were separated. Additionally, the 21R CFETP has these areas separated into the core competencies of Contingency Operations (equivalent to the Deployment mission set) and Distribution (Department of the Air Force, 2009). For those reasons, Deployment and Distribution were separated into their own mission sets for the purpose of this study and were listed this way on the KSA Development worksheets.

Second, the way the mission sets of Joint Logistics and Life Cycle Logistics are depicted in the pyramid do not align with what our 21R officers see in the field. The proposed pyramid shows that Life Cycle Logistics and Joint Logistics opportunities occur much later in an LRO's career. Life Cycle Logistics begins at the Major level, and Joint Logistics begins at the Lieutenant Colonel and Colonel level. The interview responses indicate that both Joint Logistics and Life Cycle Logistics should be their own separate pyramids in line with the other five. The responses indicate that more and more junior officers are filling roles in these mission sets, and that should be reflected in the pyramid. Many examples were given where young Lieutenants and Captains deployed to fill traditional and non-traditional (jobs that were not coded as joint, but were joint in nature) Joint Logistics positions and would be well served by receiving joint training and education earlier in their careers. One Colonel's response to the pyramid's representation of the mission sets was, "It's completely flawed." He felt the pyramid needs to acknowledge that our 21R CGOs get Joint Logistics experience very early on. He used the example of his executive officer's recent deployment to South America where the entire J-4 staff was comprised of CGOs. However, his executive officer was not prepared before hand and needed to learn as he went. The Colonel went on to say that the "Marine and Army guys can be plugged in from day one, and the Navy is catching up fast. We as an Air Force, we are tail end Charlie right now." He felt this was because the Marines, Army, and Navy are taught Joint Logistics from the beginning of their careers, and the Air Force needs to start teaching it at technical school. The Colonel concluded his thoughts by saying, "If the Air Force doesn't keep up with this common language of Joint Logistics, we are going to be left behind." The overarching theme was that if the mission

sets are not highlighting that they begin at the onset of a career, then the individual will

not be trained for that mission set early enough.

Each of the 40 focus groups were also asked if the mission sets were accurate, and

if any mission sets were left out of the research. The feedback was that the mission sets

were accurate, but several teams did provide additional mission sets. Fuels Management,

Program Management, Acquisitions Management, and Depot Maintenance were

suggested once each as being possible mission sets a 21R could operate in. Human

Capital Management was proposed by two teams. With these additional mission sets

only being mentioned by 2.5 percent (Fuels Management, Program Management,

Acquisitions Management, and Depot Maintenance) and 5 percent (Human Capital

Management) of the focus groups, they were not included as separate mission sets in the

study. Furthermore, the additional mission sets provided by the focus groups are covered

by the original mission sets of the study. Feedback from both the interviews and focus

groups suggest the mission sets of Deployment, Distribution, Materiel Management, Life

Cycle Logistics, and Joint Logistics are the mission sets a 21R operates in, and all of the

mission sets should be depicted as starting at the beginning of a career.

Investigative Question #2: What are the primary KSAs for each mission set?

A KSA development worksheet was completed by each of the 40 focus groups

(Figure 5), and then the inputs for each mission set were combined into one product. A

panel of four logistics practitioners independently analyzed the lists and categorized

homogenous responses into parent KSAs. Consensus was achieved, and the final list of

KSAs for each mission set follows (Tables 10-14). For ease of reference, the mission

sets have been color coded in the following tables and charts. Deployment is green, Distribution is black, Materiel Management is red, Life Cycle Logistics is blue, and Joint Logistics is purple. Of the 40 focus groups, 35 provided inputs for the Deployment mission set, 32 provided inputs for the Distribution mission set, 34 provided inputs for the Materiel Management mission set, 29 provided inputs for the Life Cycle Logistics mission set, and 31 provided inputs for the Joint Logistics mission set. Each mission set's KSAs are sorted from largest to smallest "Grp Freq" number. The "Grp Freq" column lists how many groups included a response that fell underneath the parent KSA, and the "Freq" column lists how many times any item that fell underneath the parent KSA was mentioned. For instance, 20 groups mentioned a total of 38 different items that fell into the Information Management KSA for the Deployment mission set. A comprehensive list of the sub-KSAs that comprise the each parent KSA can be found in Appendix A.

An important distinction needs to be made with the following tables. Each parent KSA represents what a focus group felt was important for a given mission set. Some of these parent KSAs are comprised of numerous sub-KSAs, and some are comprised of only one sub-KSA. Therefore, some of the parent KSAs may appear more frequently because of the number of sub-KSAs within it.   In conclusion, one cannot accurately infer that a KSA is more important solely because it was mentioned more frequently.   To assess the level of importance, a large sample survey should be performed within the 21X career fields. Such a survey is beyond the scope of the current study and is left for future research.

Table 10: Deployment Mission Set KSAs

Deployment							
KSA	Freq	Grp Freq	Percent of Grps	KSA	Freq	Grp Freq	Percent of Grps
Information Management	38	20	57.1	Adaptability	4	4	11.4
Installation Deployment Planning	26	17	48.6	Contracting	4	4	11.4
Plans Management	25	16	45.7	Funding	4	3	8.6
Cargo Movement	18	14	40.0	Process Improvement	4	3	8.6
Business Acumen	21	13	37.1	Packaging/Crating/Palletizing	3	3	8.6
Personnel Movement	14	13	37.1	Safety	3	3	8.6
TPFDD Mgmt	10	10	28.6	Port Management	3	3	8.6
Readiness	11	9	25.7	Analysis	2	2	5.7
Governing Documents	9	9	25.7	Cargo Deployment Function	2	2	5.7
Leadership	16	8	22.9	Equipment Management	2	2	5.7
Personnel Management	10	8	22.9	Support Agreements	2	2	5.7
Forecasting	8	8	22.9	WRM Management	2	2	5.7
Base Support/Expeditionary Site Plans	7	7	20.0	Production Management	1	1	2.9
UTC Management	7	6	17.1	Asset Management	2	1	2.9
Deployment Operations - Site Surveys	6	6	17.1	Acquisitions	1	1	2.9
Customer Service	6	5	14.3	Air Cargo Procedures	1	1	2.9
Aerospace Planning	5	5	14.3	Air Trans	1	1	2.9
International Logistics	5	5	14.3	Disposition	1	1	2.9
Scheduling	5	5	14.3	Industrial Engineering	1	1	2.9
Aircraft Generation	5	4	11.4	Mobility Operations	1	1	2.9
Communication	5	4	11.4	Repair Cycle	1	1	2.9
Deployable Skills	5	4	11.4	Systems Engineering	1	1	2.9

The most frequently cited KSAs for the Deployment mission set were information management (mentioned by 57.1 percent of focus groups), installation deployment planning (48.6 percent of focus groups), plans management (45.7 percent of focus groups), cargo movement (40 percent of focus groups), business acumen (37.1 percent of focus groups), and personnel movement (37.1 percent of focus groups). The list of KSAs provided by the focus groups is more in depth than that of the DoD HCS study (Figure 3),

where Deployment was combined with Distribution and only included deployment

planning as a competency.

Table 11: Distribution Mission Set KSAs

Distribution							
KSA	Freq	Grp Freq	Percent of Grps	KSA	Freq	Grp Freq	Percent of Grps
Cargo Movement	38	21	65.6	Port Management	4	3	9.4
Information Management	18	14	43.8	Vehicle Management	4	3	9.4
Business Acumen	19	12	37.5	Air Cargo Procedures	3	3	9.4
Packaging/Crating/Palletizing	11	11	34.4	Fuels Management	3	3	9.4
Governing Documents	11	9	28.1	Personnel Mgmt	3	3	9.4
Personnel Movement	8	8	25.0	Process Improvement	3	2	6.3
Customer Service	8	7	21.9	Adaptability	2	2	6.3
Warehouse Management	7	7	21.9	Air Trans	2	2	6.3
Industrial Engineering	7	6	18.8	Analysis	2	2	6.3
Plans Management	7	6	18.8	Communication	2	2	6.3
Safety	6	6	18.8	Mobility Operations	2	2	6.3
Contracting	5	5	15.6	Scheduling	2	2	6.3
Disposition	5	5	15.6	Acquisitions	1	1	3.1
Funding	5	5	15.6	Flightline Operations	1	1	3.1
International Logistics	5	5	15.6	Household Goods	1	1	3.1
Leadership	10	4	12.5	Production Mgmt	1	1	3.1
Enterprise Logistics	6	4	12.5	Repair Cycle	1	1	3.1
Asset Management	4	4	12.5	Shelf Life Program	1	1	3.1
Forecasting	4	4	12.5	Stock Control Process	1	1	3.1
Sourcing	4	4	12.5	Systems Engineering	1	1	3.1

The focus groups' most repeated KSAs for the Distribution mission set were

cargo movement (mentioned by 65.6 percent of focus groups), information management

(43.8 percent of focus groups), business acumen (37.5 percent of focus groups),

packaging/crating/palletizing (34.4 percent of focus groups), and governing documents

(28.1 percent of focus groups). This mission set also aligns with the

Deployment/Distribution/Transportation workforce category of the DoD HCS study. The

HCS study's competency of physical distribution/transportation operations is covered by
the Distribution mission set's cargo movement KSA.

Table 12: Materiel Management Mission Set KSAs

Materiel Management							
KSA	Freq	Grp Freq	Percent of Grps	KSA	Freq	Grp Freq	Percent of Grps
Information Management	23	17	50.0	Communication	4	4	11.8
Asset Management	22	16	47.1	MICAPs	4	4	11.8
Repair Cycle	21	15	44.1	Process Improvement	5	3	8.8
Contracting	18	15	44.1	Equipment Mgmt	4	3	8.8
Forecasting	12	11	32.4	Fuels Management	3	3	8.8
Business Acumen	17	10	29.4	Personnel Mgmt	3	3	8.8
Analysis	13	10	29.4	Production Mgmt	3	3	8.8
Enterprise Logistics	13	10	29.4	Leadership	5	2	5.9
Customer Service	10	10	29.4	Adaptability	2	2	5.9
Warehouse Management	10	10	29.4	Scheduling	2	2	5.9
Sourcing	9	9	26.5	WRM Management	2	2	5.9
Disposition	9	8	23.5	Industrial Engineering	1	1	2.9
Stock Control Processes	9	7	20.6	International Logistics	1	1	2.9
Cargo Movement	7	6	17.6	Munitions Mgmt	1	1	2.9
Funding	6	6	17.6	Port Management	1	1	2.9
Governing Documents	5	5	14.7	Requirements	1	1	2.9
Packaging/Crating/Palletizing	5	5	14.7	Safety	1	1	2.9
Acquisitions	5	4	11.8	Vehicle Management	1	1	2.9
Plans Management	5	4	11.8				

The Materiel Management mission set's most frequently mentioned KSAs were
information management (mentioned by 50 percent of focus groups), asset management
(47.1 percent of focus groups), repair cycle (44.1 percent of focus groups), contracting
(44.1 percent of focus groups), and forecasting (32.4 percent of focus groups). Once
again, this mission set relates well with the DoD HCS study's Supply Management
workforce category. All of its competencies, forecasting and demand planning, supply
planning, sourcing, and inventory management are included within the focus groups'

KSAs for Materiel Management. Inventory management is included as a sub-KSA of asset management.

Table 13: Life Cycle Logistics Mission Set KSAs

Life Cycle Logistics							
KSA	Freq	Grp Freq	Percent of Grps	KSA	Freq	Grp Freq	Percent of Grps
Business Acumen	25	13	44.8	Customer Service	4	4	13.8
Repair Cycle	17	13	44.8	Requirements	8	3	10.3
Acquisitions	13	13	44.8	Adaptability	3	3	10.3
Forecasting	12	12	41.4	Industrial Engineering	3	3	10.3
Contracting	14	11	37.9	Plans Management	3	3	10.3
Funding	13	9	31.0	Scheduling	3	3	10.3
Disposition	11	9	31.0	Warehousing Management	3	3	10.3
Process Improvement	10	8	27.6	Communication	2	2	6.9
Asset Management	8	6	20.7	Leadership	4	1	3.4
Governing Documents	7	6	20.7	Stock Control Processes	2	1	3.4
Information Management	7	6	20.7	Enterprise Logistics	1	1	3.4
Personnel Management	7	6	20.7	Equipment Management	1	1	3.4
Sourcing	6	6	20.7	International Logistics	1	1	3.4
Analysis	6	5	17.2	Packaging/Crating/Palletizing	1	1	3.4
Research/Development	6	5	17.2	Production Management	1	1	3.4

The most repeated KSAs for the Life Cycle Logistics mission set were business acumen (mentioned by 44.8 percent of focus groups), repair cycle (44.8 percent of focus groups), acquisitions (44.8 percent of focus groups), forecasting (41.4 percent of focus groups), and contracting (37.9 percent of focus groups). Unlike the prior mission sets, the Life Cycle Logistics mission set KSAs do not appear to converge with the competencies of the LCL workforce category of the DoD HCS study. Planning, product support, and technical data are included; however the remaining competencies were not

mentioned by the focus groups. The sub-KSAs in Appendix A do not include these

either.

Table 14: Joint Logistics Mission Set KSAs

Joint Logistics							
KSA	Freq	Grp Freq	Percent of Grps	KSA	Freq	Grp Freq	Percent of Grps
Service Culture/Org Capabilities	26	15	48.4	Deployable Skills	2	2	6.5
Communication	13	11	35.5	Industrial Engineering	2	2	6.5
Governing Documents	13	11	35.5	Personnel Movement	2	2	6.5
Information Management	16	10	32.3	Repair Cycle	2	1	3.2
Cargo Movement	15	10	32.3	Aerospace Planning	1	1	3.2
Plans Management	13	9	29.0	Air Cargo Procedures	1	1	3.2
Sister Service Interoperability	10	8	25.8	Base Support/Expeditionary Site Plans	1	1	3.2
International Logistics	9	8	25.8	Deployment Ops/Site Surveys	1	1	3.2
Classes of Supply	6	6	19.4	Disposition	1	1	3.2
Business Acumen	11	5	16.1	Equipment Management	1	1	3.2
Asset Management	5	5	16.1	Packaging/Crating/Palletizing	1	1	3.2
Contracting	4	4	12.9	Port Management	1	1	3.2
Customer Service	4	4	12.9	Process Improvement	1	1	3.2
Leadership	6	3	9.7	Production Management	1	1	3.2
Personnel Management	4	3	9.7	Safety	1	1	3.2
Enterprise Logistics	3	3	9.7	Stock Control Processes	1	1	3.2
Forecasting	3	3	9.7	Systems Engineering	1	1	3.2
Funding	3	3	9.7	TPFDD Management	1	1	3.2
Acquisitions	2	2	6.5	Warehouse Management	1	1	3.2
Adaptability	2	2	6.5				

The Joint Logistics mission set KSAs mentioned most by the focus groups were

service culture/organizational capabilities (mentioned by 48.4 percent of focus groups),

communication (35.5 percent of focus groups), governing documents (35.5 percent of

focus groups), information management (32.3 percent of focus groups), and cargo

movement (32.3 percent of focus groups).

Investigative Question 3: What KSAs overlap into multiple mission sets?

Cross-team analyses of the results from the focus groups were performed to address this question. First, a master KSA list was developed that included every unique KSA from the mission sets. Although there were 192 line items between the mission sets, analysis revealed there were only 60 unique KSAs between them. The 60 KSAs are listed in Table 15.   Next, each mission set was given a region designator (Table 16) and the KSAs were clustered into regions that span multiple mission sets in order to visualize all the KSAs that occur in a given region (Table 17). Finally, a visual representation of the overlapping KSAs are shown in Figure 6.

Of the 60 KSAs listed by the focus groups, 75 percent of them spanned multiple mission sets. There were 21 KSAs identified as being needed across all 5 mission sets, 10 were identified as being needed across 4 mission sets, 3 were identified as being needed across 3 mission sets, and 11 were identified as being needed across 2 mission sets. Although the depth a logistician needs in each KSA was not determined in this study, a substantial amount of overlap between the mission sets of Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics was discovered. Some of these KSAs, such as adaptability, business acumen, communication, leadership, process improvement, and enterprise logistics are similar to the fundamental and leadership/management competencies listed in the DoD HCS study (Figure 3).

Table 15: Comprehensive List of KSAs

#	Parent KSAs	#	Parent KSAs
1	Acquisitions	31	International Logistics
2	Adaptability	32	Leadership
3	Aerospace Planning	33	MICAPs
4	Air Cargo Procedures	34	Mobility Operations
5	Air Trans	35	Munitions Management
6	Aircraft Generation	36	Packaging/Crating/Palletizing
7	Analysis	37	Personnel Management
8	Asset Management	38	Personnel Movement
9	Base Support and Expeditionary Site Planning	39	Plans Management
10	Business Acumen	40	Port Management
11	Cargo Deployment Function	41	Process Improvement
12	Cargo Movement	42	Production Management
13	Classes of Supply	43	Readiness
14	Communication	44	Repair Cycle
15	Contracting	45	Requirements
16	Customer Service	46	Research and Development
17	Deployable Skills	47	Safety
18	Deployment Operations - Site Surveys	48	Scheduling
19	Disposition	49	Service Culture/Org Capabilities
20	Enterprise Logistics	50	Shelf Life Program
21	Equipment Management	51	Sister Service Interoperability
22	Flightline Operations	52	Sourcing
23	Forecasting	53	Stock Control Processes
24	Fuels Management	54	Support Agreements
25	Funding	55	Systems Engineering
26	Governing Documents	56	TPFDD Management
27	Household Goods	57	UTC Management
28	Industrial Engineering	58	Vehicle Management
29	Information Management	59	Warehouse Management
30	Installation Deployment Planning	60	WRM Management

Table 16: Mission Set Regions

Mission Set	Region Designator
Deployment	A
Distribution	B
Materiel Management	C
Life Cycle Logistics	D
Joint Logistics	E

Table 17: Cluster Regions of KSAs

| KSA #	Parent KSA	Regions	KSA #	Parent KSA	Regions
1	Acquisitions	ABCDE	12	Cargo Movement	ABCE
2	Adaptability	ABCDE	38	Personnel Movement	ABCE
8	Asset Management	ABCDE	40	Port Management	ABCE
10	Business Acumen	ABCDE	47	Safety	ABCE
14	Communication	ABCDE	21	Equipment Management	ACDE
15	Contracting	ABCDE	20	Enterprise Logistics	BCDE
16	Customer Service	ABCDE	53	Stock Control Processes	BCDE
19	Disposition	ABCDE	59	Warehouse Management	BCDE
23	Forecasting	ABCDE	4	Air Cargo Procedures	ABE
25	Funding	ABCDE	55	Systems Engineering	ABE
26	Governing Documents	ABCDE	52	Sourcing	BCD
28	Industrial Engineering	ABCDE	5	Air Trans	AB
29	Information Management	ABCDE	34	Mobility Operations	AB
31	International Logistics	ABCDE	60	WRM Management	AC
32	Leadership	ABCDE	3	Aerospace Planning	AE
36	Packaging/Crating/Palletizing	ABCDE	9	Base Support and Expeditionary Site Planning	AE
37	Personnel Management	ABCDE
39	Plans Management	ABCDE	17	Deployable Skills	AE
41	Process Improvement	ABCDE	18	Deployment Operations - Site Surveys	AE
42	Production Management	ABCDE	56	TPFDD Management	AE
44	Repair Cycle	ABCDE	24	Fuels Management	BC
7	Analysis	ABCD	58	Vehicle Management	BC
48	Scheduling	ABCD	45	Requirements	CD
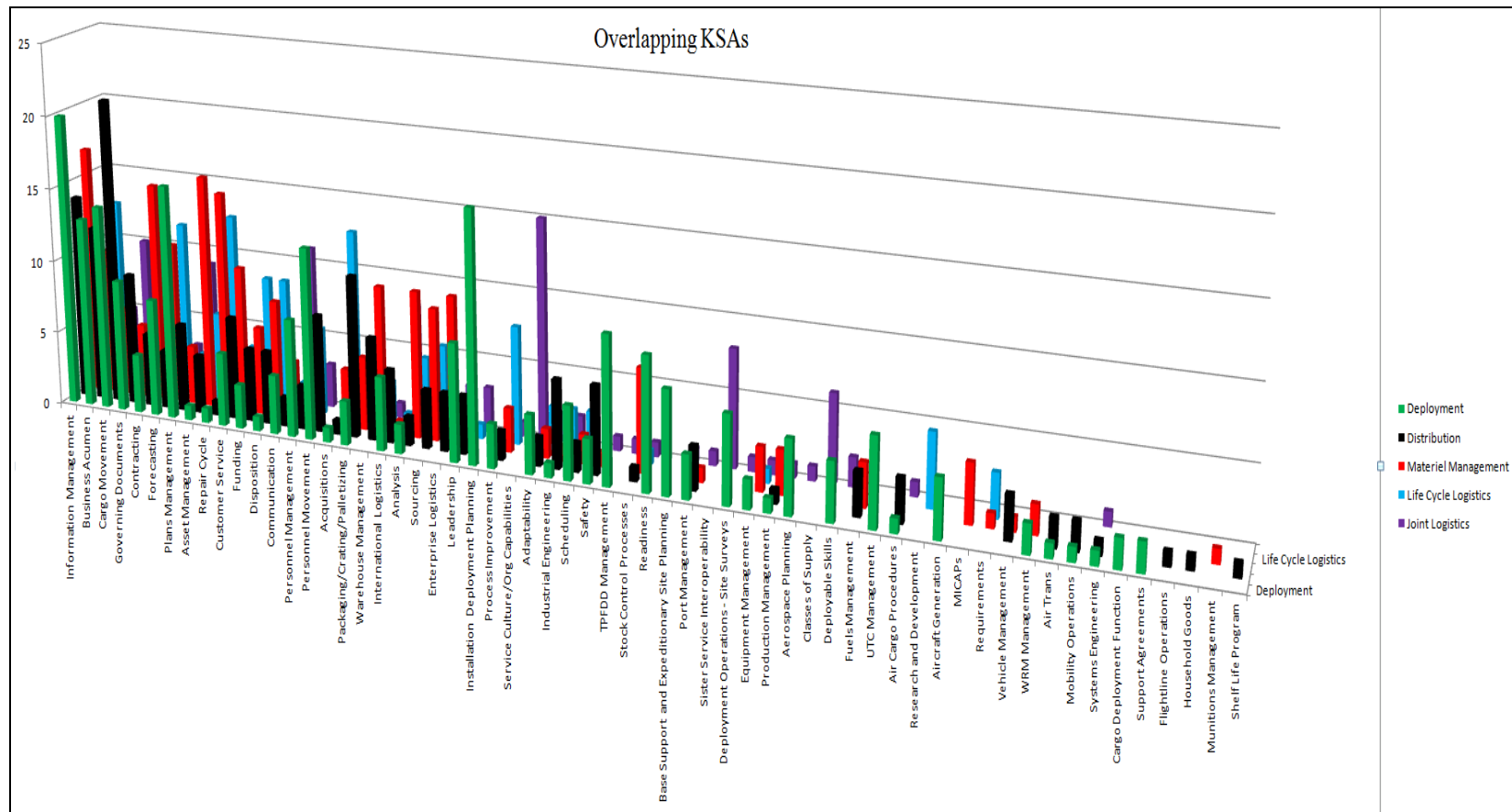
Figure 6: Overlapping KSAs

Investigative Question 4: What KSAs do we currently lack and/or not teach well/at all?

Each interviewee was asked their opinion on which KSAs are not taught well or at all, and the top responses are included in Table 18. The most prevalent KSAs from the 42 interviewees were an enterprise view/understanding of interrelating pieces, depth in job knowledge, communication, process improvement, and joint knowledge.

Table 19 summarizes the top responses given during the interviews by 21R personnel. The top three responses of depth, enterprise view, and joint are also seen in the top three overall findings. Depth was of particular concern, and the phrase "LROs are an inch deep and a mile wide" was voiced by many of the interviewees. Another interviewee stated, "Our positions on MAJCOM and other staffs are being asked to be very deep and knowledgeable on subject matters, and they don't have it." The interviewee explained that this lack of depth can hurt the decision making policy because individuals may make decisions solely on time and cost instead of understanding the ramifications of their actions. In the past that person could ask someone else in the office, but now some of these are becoming one-deep positions. Two interviewees specifically mentioned the lack of depth hurts policy making, with one stating, "There is a lack of stove piping right now. We have a problem making policies because we lack expertise." Their reasoning was that the staffs need to make decisions, but they are inexperienced. The staff then relies on people in the field to get answers, but that delays the right policy they need in order to operate. This can have a trickledown effect where many OIs are developed at each MAJCOM for the same issue with no standardization between them. This all happens because the person on staff lacked the appropriate

experience. Several interviewees felt LROs lack an enterprise view and understanding of all the interrelating pieces. One explained that LROs do not understand how their actions impact other enabling functions. The interviewee thought that if LROs better understood what their upstream and downstream customers did and what they needed, and how those enabling functions impact the LRO, they would be much more effective in their job. The overarching attitude on joint skills was that LROs are far above other Air Force career fields, but they are still behind the logisticians of sister-services. One interviewee said, "If we had more joint skills, we would have more logisticians filling senior joint logistics positions. We would also have more Air Force solution sets for Joint problems. Everything we do is purple, even humanitarian relief. There's a saying, if you're not at the table, you're on the menu. Right now, we're not at the table." The interviewee felt that if we had the right skills, the AF would get a bigger piece of the pie in joint solutions.

Table 18: Top Interview Responses to Research Question 4

	1	Enterprise View/Interrelating Pieces	21.4%
	2	Depth	16.7%
	3	Joint	11.9%
	4	Process Improvement	9.5%
Overall	5	Communication (oral/written)	9.5%
	6	Field Experience	9.5%
	7	Leadership Abilities	7.1%
	8	IT	7.1%
	9	HR Mgmt/Labor Mgmt	7.1%

Table 19: Top 21R Interview Responses to Investigative Question 4

21R	1	Depth	28.6%
	2	Enterprise View/Interrelating Pieces	23.8%
	3	Joint	19.0%
	4	Critical Thinking/Root Cause Analysis	14.3%
	5	IT	9.5%
	6	Communication (oral/written)	9.5%
	7	Deployment Processes	9.5%

Each focus group was asked for their inputs as well. Each team was tasked with identifying KSAs they felt were not taught well to 21X officers. The aggregate results spanning all mission sets follow (Figure 6), and then the results are broken down by AFSC (Figures 7 and 8). It is worth explaining that the "Cited as Needed" numbers may be higher than 40 (number of focus groups participating) for some of the KSAs in the following 3 figures. This is because these figures are inclusive of all five mission sets. For example, if the information management KSA was cited as needed by 15 groups in each of the five mission sets, the "Cited as Needed" number would be 75.

All Team Comments:
**KSAs Not Taught Well Or At All**
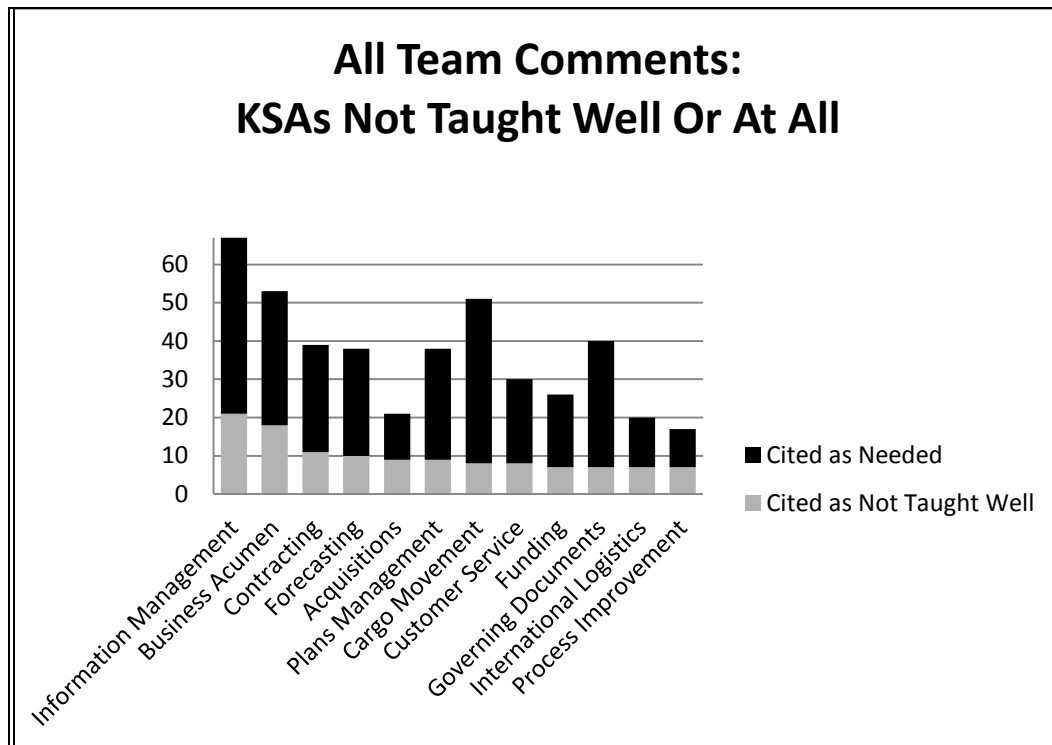
Figure 7: Top Aggregate Focus Group Comments of KSAs not Taught Well or at All

Information management, business acumen, and contracting were the KSAs mentioned most often across all mission sets as not being taught well enough or at all. In all, information management was mentioned as being needed 67 times across the mission sets, and it was labeled as not being taught well enough 31.3 percent of those times. Business acumen was labeled as not being taught well enough 34 percent of the time it was mentioned as being needed, and contracting was labeled as not being taught well enough 28.2 percent of the time it was mentioned as being needed.   The KSAs with the highest percentage of being mentioned as lacking were acquisitions at 42.9 percent (21 times mentioned as needed; 9 of those as not being taught well enough) and process improvement at 41.2 percent (17 times mentioned as needed; 7 of those as not being taught well enough).

21R Team Comments:
## KSAs Not Taught Well Or At All
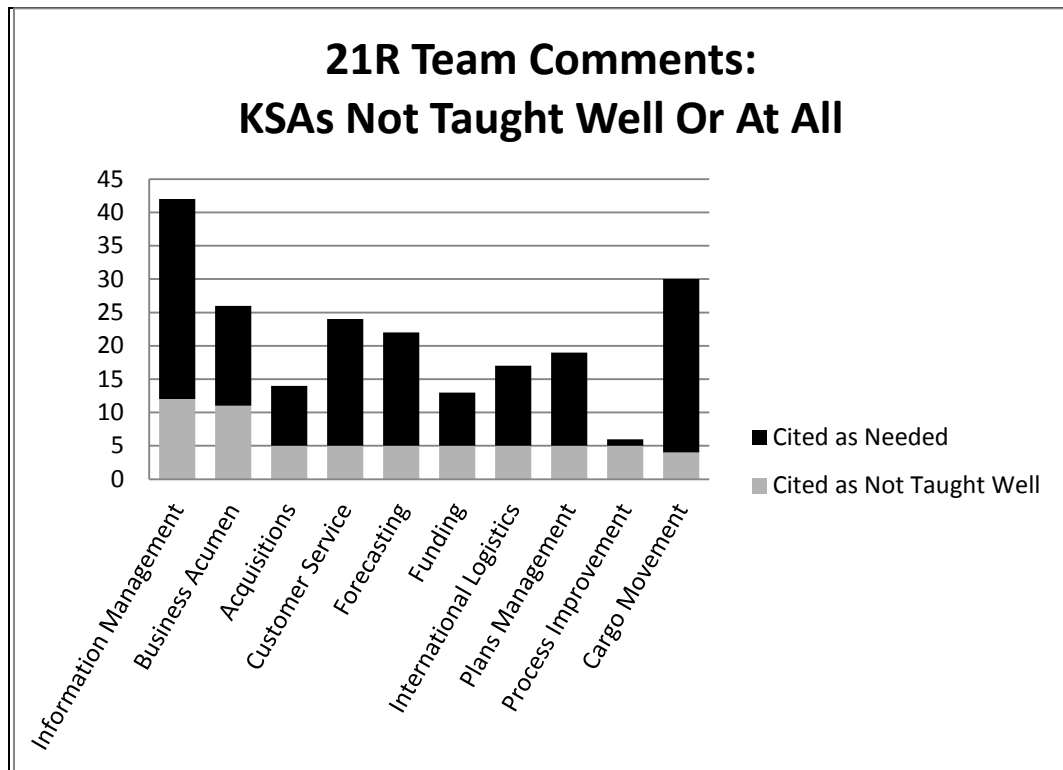
Figure 8: 21R Focus Group Team Comments of KSAs not Taught Well or at All

The 21R focus group team responses were very similar to the overall responses. Information management and business acumen were the most frequent responses; however acquisitions replaced contracting as the third most frequent response. Information management was pointed out 42 times across the mission sets as being needed, and was mentioned as not being taught well enough 28.6 percent of those times. Business acumen was mentioned 26 times and was labeled as not being taught well enough in 42.3 percent of those instances. Acquisitions was mentioned as being needed 14 times across the mission sets and was labeled as not being taught well enough 35.7 percent of those times. The KSAs with the highest percentage of being mentioned as

lacking were process improvement at 83.3 percent (5 out of 6 times mentioned) and

business acumen at 42.3 percent (11 out of 26 times mentioned).

## 21A Team Comments: KSAs Not Taught Well Or At All
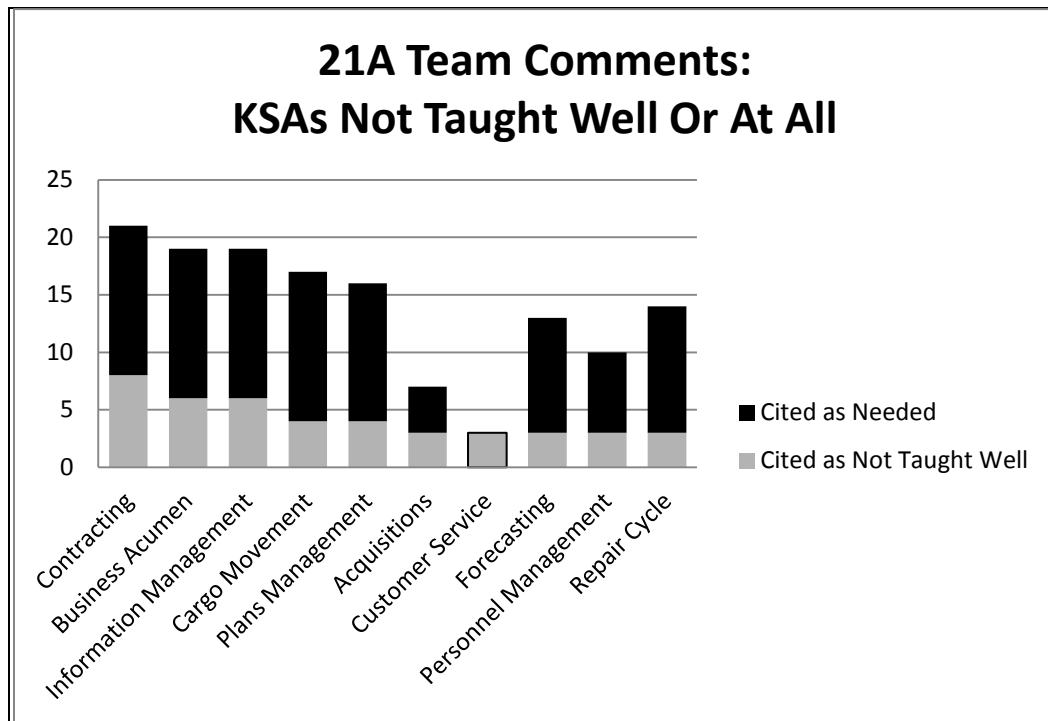
Figure 9: 21A Focus Group Team Comments of KSAs not Taught Well or at All

Looking at the 21A responses, one can see a lot of similarity with the 21R and

overall responses. The most often mentioned KSAs were contracting, business acumen,

and information management. Contracting was cited 21 times by 21A focus groups as

being needed across the mission sets, and 38.1 percent of those times it was labeled as not

being taught well enough. Business acumen and information management were each

cited 19 times, and each were mentioned as not being taught well enough 31.6 percent in

those cases. Customer service and acquisitions were the KSAs with the highest

percentage of being mentioned as lacking. Customer service was labeled as lacking 100

percent of the time it was mentioned (3 out of 3 times mentioned), and acquisitions was labeled as lacking 42.9 percent of the times it was mentioned (3 out of 7 times mentioned).

Focus group results for KSAs not taught well or at all for each mission set of Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics are illustrated next (Figures 10 – 13).
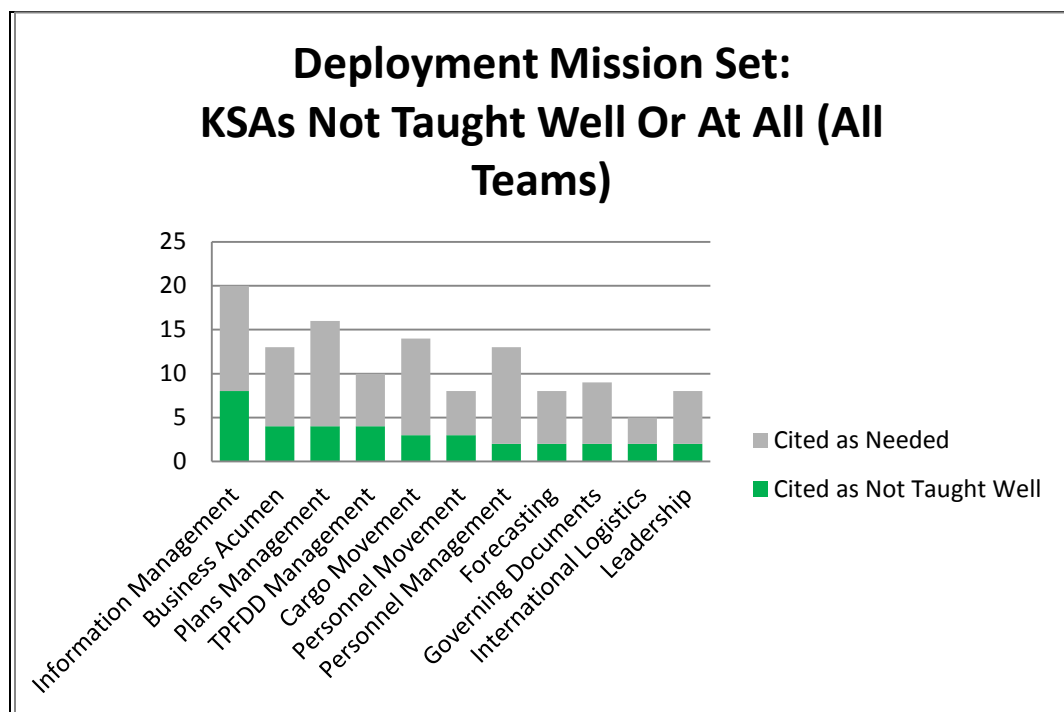

Figure 10: Deployment Mission Set KSAs not Taught Well or at All

Information management, business acumen, and plans management were the KSAs most often mentioned as not being taught well enough in the Deployment mission set. Information management was labeled as not being taught well enough 8 out of the 20 times (40 percent) it was mentioned as a need in the Deployment mission set. Focus

groups labeled business acumen as not being taught well enough 4 out of the 13 times (30.8 percent) it was mentioned as a need, and plans management was labeled as not being taught well enough 4 out of the 16 times (25 percent) it was mentioned as a need. Personnel movement, Time-Phased Force Deployment Data (TPFDD) management, and information management were the KSAs with the highest percentage of being cited as not being taught well enough or at all. Personnel movement was mentioned as lacking 45.5 percent of the time it was mentioned as needed (4 out of 10 times mentioned), information management was cited as lacking 40 percent of the time it was mentioned (8 out of 20 times mentioned), and TPFDD management was described as not being taught well enough 40 percent of the time it was mentioned as a need (4 out of 10 times mentioned).
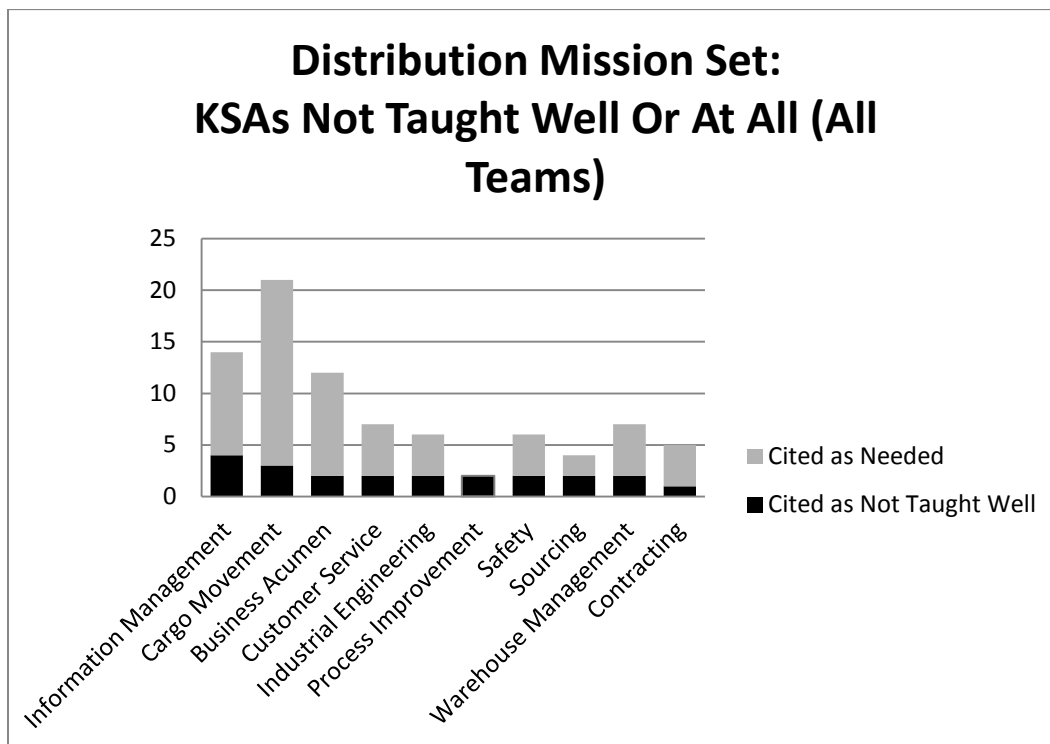

Figure 11: Distribution Mission Set KSAs not Taught Well or at All

The Distribution mission set's top responses for this investigative question were information management, cargo movement, and business acumen. Information management was cited as being not taught well or at all 28.6 percent of the time it was mentioned as being needed (4 out of 14 times mentioned), cargo movement was labeled as not being taught well enough or at all 14.3 percent of the times it was mentioned as being needed (3 out of 21 times mentioned), and business acumen was cited as not being taught well enough or at all 16.7 percent of the time it was mentioned as being needed (2 out of 12 times mentioned). Process improvement and sourcing were the KSAs with the highest percentage of being mentioned as lacking. Process improvement was mentioned as lacking 100 percent of the time it was mentioned (2 out of 2 times mentioned), and sourcing was mentioned as lacking 50 percent of the time it was mentioned (2 out of 4 times mentioned).
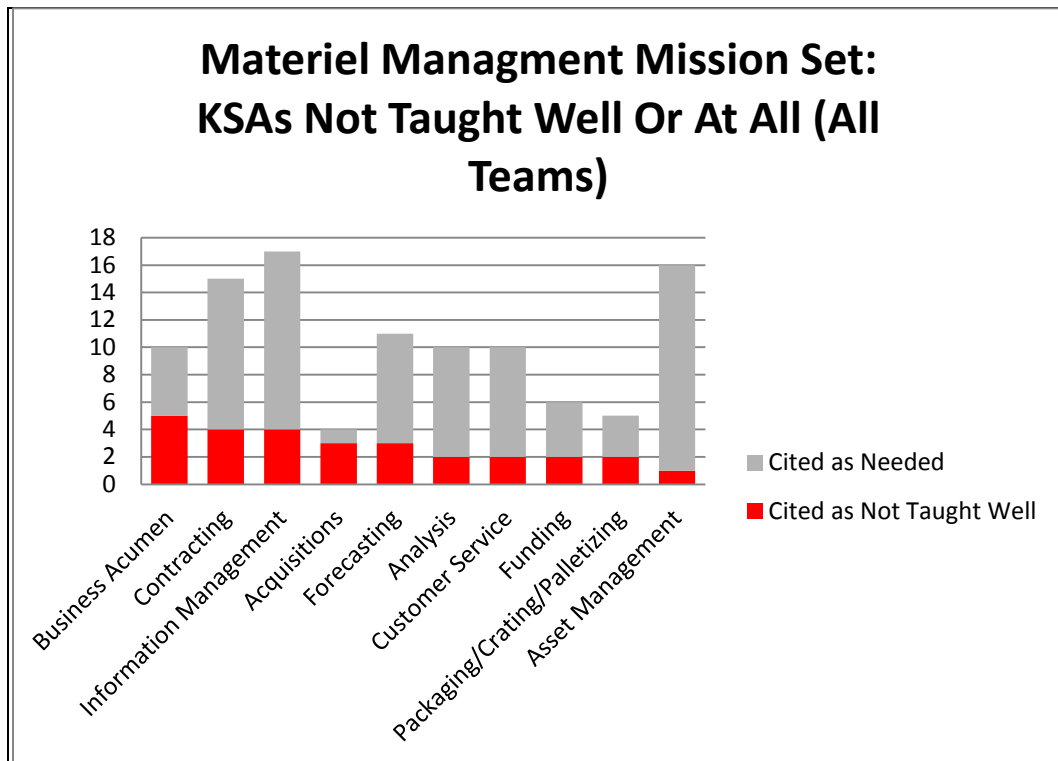
Figure 12: Materiel Management Mission Set KSAs not Taught Well or at All

For the Materiel Management mission set, business acumen, contracting, and information management were the most often cited as not being taught well enough or at all. Business acumen was labeled as not being taught well enough 50 percent of the time it was mentioned as being needed (5 out of 10 times mentioned), contracting was cited as being not taught well enough or at all 26.7 percent of the time it was mentioned as being needed (4 out of 15 times mentioned), and information management was labeled as not being taught well enough or at all 23.5 percent of the time it was mentioned as being needed (4 out of 17 times mentioned). Acquisitions and business acumen were the KSAs with the highest percentage of being labeled as lacking. Acquisitions was labeled as lacking 75 percent of the time it was mentioned as being needed (3 out of 4 times

mentioned), and business acumen was labeled as lacking 50 percent of the time it was

mentioned as being needed.

Life Cycle Logistics Mission Set:
KSAs Not Taught Well Or At All (All
Teams)
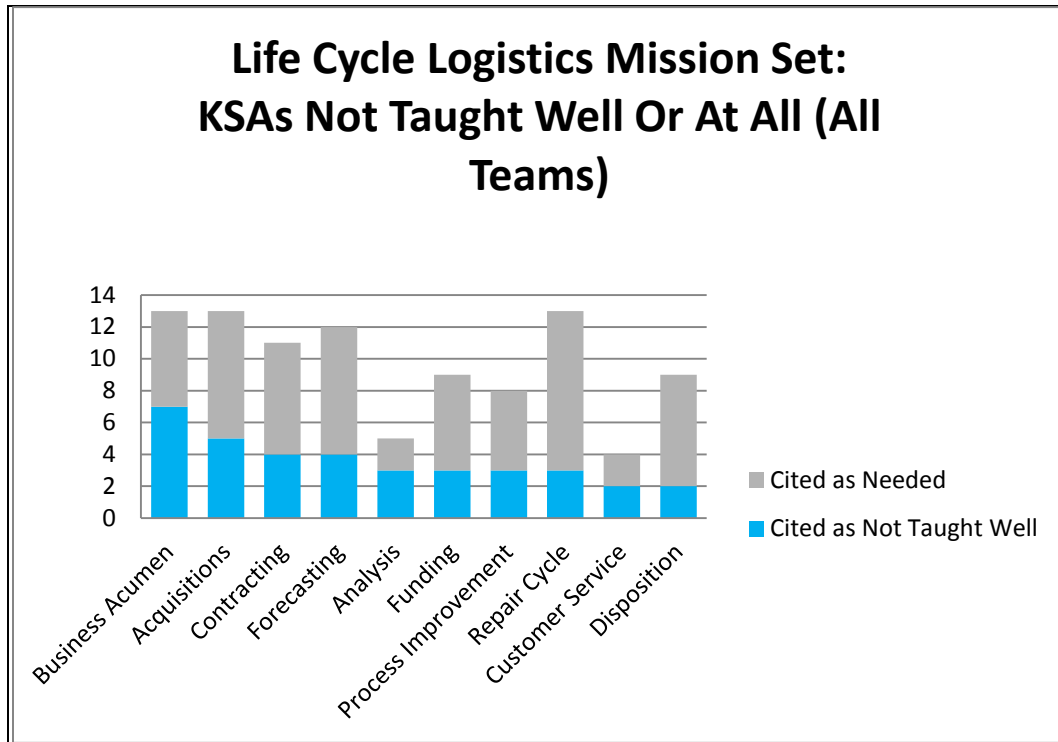
Figure 13: Life Cycle Logistics Mission Set KSAs not Taught Well or at All

Business acumen, acquisitions, and contracting were the KSAs most often cited as

not being taught well enough or at all within the Life Cycle Logistics mission set.

Business acumen was labeled as not being taught well enough 53.8 percent of the time it

was mentioned as being needed (7 out of 13 times mentioned), acquisitions was labeled

as not being taught well enough or at all 38.5 percent of the time it was mentioned as

being needed (5 out of 13 times mentioned), and contracting was cited as being not taught

well enough or at all 36.4 percent of the time it was mentioned as being needed (4 out of

11 times mentioned). The KSAs with the highest percentage of being mentioned as

lacking were analysis (60 percent; 3 out of 5 times mentioned) and business acumen

(53.8 percent; 7 out of 13 times mentioned).
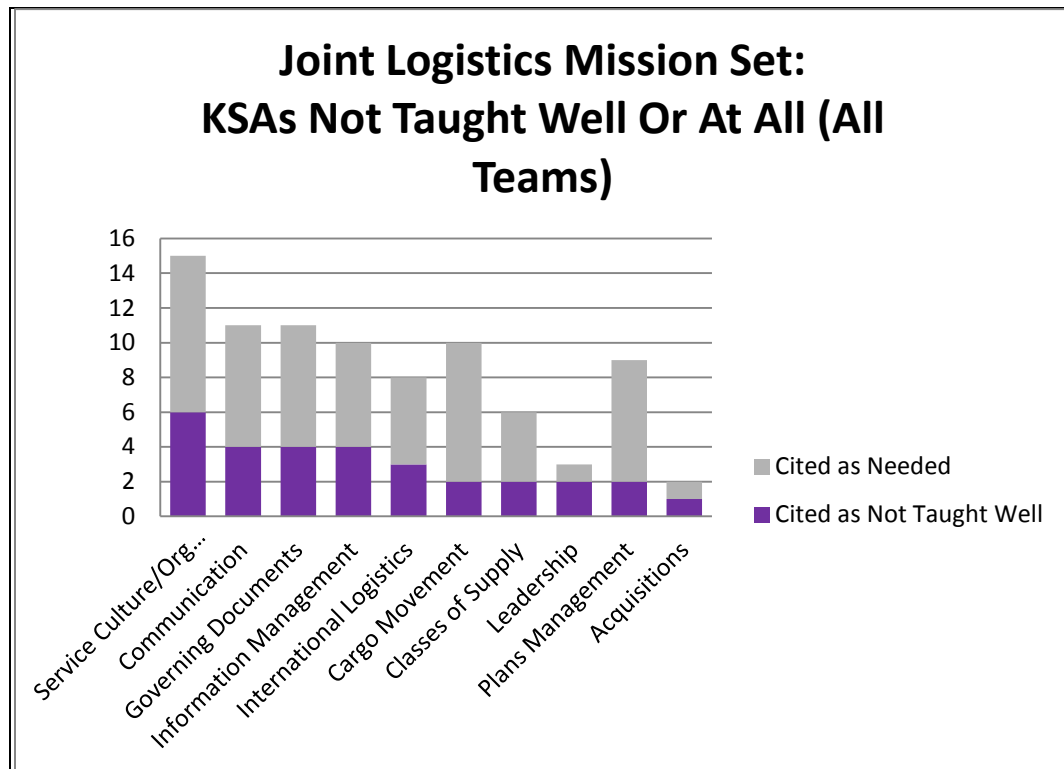
Figure 14: Joint Logistics Mission Set KSAs not Taught Well or at All

The KSAs within the Joint mission set most often cited as not being taught well

enough or at all were service culture and organizational capabilities, communication, and

governing documents. Service culture and organizational capabilities was mentioned as

lacking 40 percent of the time it was mentioned as being needed (6 out of 15 times

mentioned). Both communication and governing documents were each labeled as not

being taught well enough or at all 36.4 percent of the time they were mentioned as being

needed (4 out of 11 times mentioned). Leadership and acquisitions were the KSAs most

often mentioned as lacking within the Joint mission set. Leadership was cited as lacking 66.7 percent of the time it was mentioned as being needed (2 out of 3 times mentioned), and acquisitions was labeled as lacking 50 percent of the time it was mentioned (1 out of 2 time mentioned).

Information management, business acumen, and contracting were the KSAs most often listed by the focus groups as not being taught well enough. Looking at each mission set's graph above, one can see that information mangement and business acumen are near the top in each one. Acquisitions and process improvement were the KSAs with the highest percentage of being mentioned as not being taught well enough compared to how many times they were mentioned as being needed within a mission set. Comparing these KSAs to the process/knowledge areas contained in the Logistics Readiness Officer CFETP, one can see that business acumen, contracting, acquisitions, and process improvement are nowhere to be found. These KSAs are absent in all three of the LRO core competencies of Contingency Operations, Distribution, and Materiel Management. Therefore, it comes as no surprise to the researcher that the KSAs of business acumen, contracting, acquisistions, and process improvement were thought of as not being taught well enough or at all. However, elements of information management can be found in each core competency of the CFETP, so it is somewhat surprising that this KSA was included as not being taught well.

Investigative Question 5: What problems are coming in the foreseeable future and what KSAs are needed to respond to them?

It was established earlier that the Air Force is operating in an era of economic uncertainty, and this idea permeated throughout the interviews. During the interviews,

operating with limited resources was the major theme that surfaced as to what problem is coming in the foreseeable future. Overall, 42.5 percent of interviewees stated limited resources as an upcoming problem. This included 50 percent of the 21As and 38.1 percent of the 21Rs. Interviewees felt that there is no relief on the horizons for the budgets the Air Force operates within, and that the Air Force is not prepared. Because of the wars in Afghanistan and Iraq, units could rely on Overseas Contingency Operations (OCO) funds to supplement their spending. OCO virtually eliminated the need to worry about money, but that is now changing. The Air Force has a generation of officers who have never had to work within a budget, and they are not ready for peacetime budgets.

In addition to limited resources, 9.5 percent of 21Rs (0 percent of 21As) also felt a lack of depth in the career field was a problem that would surface over the next few years. Interviewees felt this lack of depth is a result of a lack of intentional stove piping of LROs. They felt the Air Force made a corporate decision to lose core functions of expertise in order to grow generalist officers. Similar to the DoD HCS study, the interviewees felt the Air Force needs to grow a mix of specialists and generalists. This lack of stove piping is concerning, and one interviewee expressed this concern by tying it into the budgetary concern. He explained that the budget will go down and the economy will eventually get better. This will cause an exodus of retirement eligible personnel that are very deep in their knowledge. In turn, this will leave the Air Force with fewer people that have limited depth. It will be difficult to replace the experience that left, and without the deep understanding of budgeting bad decisions will be made as to how the limited dollars are spent.

Finally, 9.5 percent of 21Rs (5.6 percent of 21As) felt air base closings, openings, and the Afghanistan drawdown would be significant hurdles for the Air Force to overcome in the future. The respondents explained that the Air Force will have to be able to coordinate effectively and work closely with all armed services in order to successfully close air bases and bring equipment and personnel back from Afghanistan. Additionally, the respondents felt that inevitably more conflicts will arise in other parts of the world. The fear is that the Air Force is used to deploying to areas that already have adequate infrastructure in place, and that the skills of bare base operations have been lost.

After upcoming problems were discussed during the interviews, each participant was asked which KSAs would be needed to mitigate the problems. To combat limited resources, the KSAs of process improvement (20 percent overall; 22.2 percent of 21As; 19 percent of 21Rs), business acumen (17.5 percent overall; 27.8 percent of 21As; 9.5 percent of 21Rs), and funding (15 percent overall; 11.1 percent of 21As; 19 percent of 21Rs) were given by the respondents. Interviewees felt that if the Air Force was better at process improvement, we would not be as resource constrained as we are now. More specifically, the Air Force may need to implement Air Force Smart Operations for the 21st Century (AFSO21) Green Belt quotas instead of the current process of having Just-Do-It and AFSO21 event quotas. This would put more process improvement experts into the field where they would be more able to spearhead improvements. Interviewees felt the Air Force needs a better grasp of business acumen (ethics, analytical reasoning, negotiation skills, project management, etc.) to effectively combat the future of limited money and resources. They likened the Air Force to a multi-billion dollar industry, and felt the Air Force needed the appropriate business skills in order to get a better handle on

its costs and what they are. Business acumen would provide more science and less art when it comes to quantifying and managing costs. Finally, respondents said that an understanding of how planning, programming, and budgeting systems operate would better prepare the Air Force to fight budget battles.

To overcome a lack of depth in the Logistics Readiness Officer career field, 21Rs interviewees stated that the career field needed to intentionally stove pipe some of its officers. This would protect against knowledge loss if and when a mass exodus of retirement eligible specialists occurs, and it would help develop the right "flavor" of senior leaders.   The interviewees said this would help develop the functional experts needed for staff positions while still allowing multi-faceted officers to be developed as well.

To help combat the perceived problem of airbase openings, closings, and the Afghanistan drawdown, interviewees said the KSAs of Joint knowledge and experience (20 percent overall; 16.7 percent of 21As; 23.8 percent of 21Rs) and forward operating base/bare base operations (10 percent overall; 5.6 percent of 21As; 14.3 percent of 21Rs) would be required.   Respondents said close collaboration with sister services and inter-service agencies would be required to be successful in the Afghanistan drawdown and subsequent airbase closings.   Although one interviewee stated that he felt joint knowledge and skills are taught, he thought they were taught late to need. He felt that since the Air Force is sending more and more junior officers on deployments where joint skills are required, the skills should be taught much earlier. Additionally, the interviewees felt that air base openings would also require close collaboration with our sister services, and therefore joint skills would be needed in this instance as well. And in

order to successfully open air bases, the Air Force would need to be better at bare base operations.

In addition to those listed above, 14.3 percent of Logistics Readiness Officers felt information management would help in combating the upcoming problems. It is important to note that information management was one of the most frequent KSAs listed as not being taught well enough or at all in the previous investigative question. One interviewee stated the Air Force would not have the end-of-chain supply chain problems it has now if the Air force had adequate information technology. He felt that if the Air Force better leveraged civilian industry technologies such as the in-transit visibility (ITV) systems employed by FEDEX and UPS, a huge cost savings could be attained. The interviewee went on to explain that if a deployed Air Force member does not have accurate ITV of ordered equipment, he or she would just order more. This puts an unnecessary strain on the supply chain, and it also costs money. He felt that a system that allows any user to see where a part is in the supply chain pipeline would eliminate the superfluous orders. Another interviewee argued that if we had better knowledge of information technology, the Air Force would not have failed in its attempt to implement the Expeditionary Combat Support System (ECSS). He said the Air Force completely relied on contractors because the Air Force did not have the expertise, and this ended up costing the Air Force more than $1 Billion. He finished by saying some may not feel this is an LROs job, but if anyone spends time with an LRO throughout the day in supply, he or she would see that most of the LROs time is spent interfacing with IT. The respondents felt that Logistics Readiness Officers need a better grasp of information management if they are going to successfully maneuver through the upcoming problems.

V. Conclusions and Recommendations

Conclusions

This research was undertaken in order to lay the foundation for developing a deliberate plan for growing multi-faceted, interchangeable Logistics Officers capable of succeeding in the face of an ever-changing and challenging logistics environment. Because of the evolving environment, the mission sets an Air Force Logistics Officer operates in needed to be validated, and the critical KSAs required in each mission set also had to be identified. A combination of semi-structured interviews and structured focus groups was utilized throughout this endeavor.

Findings suggest Air Force Logistics Officers operate across all five mission sets presented in this study. Not only do 21X officers operate within the Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics mission sets, but they do so from the very onset of their careers. Because of this, it is imperative for all levels of leadership to recognize that Life Cycle and Joint Logistics opportunities occur early and often, and any visual representation of the mission sets must reflect this. If this equal representation is not made, 21X officers may not receive the training and education they require in these mission sets and may continue to be seen as unprepared for these positions.

The critical KSAs required across the five mission sets have been identified by the focus groups (Tables 10 – 14), and the vast majority span across multiple mission sets. However, the research highlights several key KSAs that are not being taught well enough or at all to 21X officers. The perception is that information management,

business acumen, contracting, acquisitions, and process improvement are all important but are currently not being taught well enough. Of these, only information management is covered in the 21R CFETP. Through the interview process, it was also discovered that today's Air Force LRO lacks depth of knowledge, an enterprise view and understanding of the interrelating pieces, Joint knowledge, and critical thinking and root cause analysis.

With today's fiscal climate, it was not surprising to discover current Air Force logisticians greatest upcoming concern was having to operate within limited budgets and with limited resources. Logisticians were also concerned that 21X officers were not prepared for the Afghanistan drawdown or future air base openings and closings. Finally, interviewees felt the lack of depth in the 21R career field would soon become a problem. If the Air Force expects to mitigate these issues, a concerted effort needs to be made to ensure 21X officers are well versed in process improvement, business acumen, the funding and budgetary process, information technology, and be given joint knowledge early on.

Recommendations

The unstable logistics environment has heightened the need for truly multi-faceted logisticians across the civilian industry and the Department of Defense. The DoD HCS study illustrated this and provided a basic framework for achieving the multi-faceted logistician across all services. For the Air Force to develop truly multi-faceted logisticians, logisticians need to be adept across all 21X mission sets, not just the traditional LRO mission sets. An understanding of Repair Network Integration and Mission Generation must occur for some 21R officers, and an understanding of

Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint

Logistics must occur for some 21A/M officers. For this to occur, a formal crossflow

program should be implemented for a select few 21X officers. As mentioned by one

interviewee, commanders know which officers can handle and deserve the additional

responsibility by the time they reach the rank of Captain. The interviewee explained that

even though 21Rs have a large amount on their plate already, there are some that will

excel at it. Those individuals are already being stratified above their peers, and those are

the ones that should enter into the crossflow program. For the program to be successful,

however, it must be codified and have top-down support. Those entering into the

program should be identified with a special experience identifier, and they should receive

multiple rotations from 6 to 18 months in duration. One rotation could happen at the rank

of Captain, and another could occur at Major or Lieutenant Colonel. Not only is an

official crossflow program popular with many of the interviewees, several stated they did

not understand why it went away in the first place.

Using the DoD HCS as a model would help alleviate some of the other major

concerns of Air Force Logistics Officers. The Air Force should take note of the DoD

HCS's requirements for a combination of "I" people, "T" people, and enterprise

logisticians (Office of the Secretary of Defense, 2008). The DoD HCS calls for ensuring

the right mix of functional experts and enterprise-wide logisticians. Because of this, the

Air Force should stovepipe a select number of logisticians in each mission set to ensure a

deep knowledge base is retained throughout the years. These individuals would also need

to be coded with an identifier to ensure they are tracked. Although these individuals

could be placed in other assignments outside of their core area, they should never spend

more than one assignment away from the core area at a time. Depth was a major concern of 21Rs in this research and was seen as both a problem we have right now, and one that will continue to worsen in the coming years. Multiple interviewees stated the need for intentional stove piping in order to reverse this perceived trend. Further research would have to be conducted to determine the most beneficial number of officers to stove pipe.

The DoD HCS could also be used to ease another important concern of 21X officers. In addition to the workforce categories contained in the DoD HCS, Fundamental Competencies and Leadership & Management Competencies are included as items that are applicable across all career fields. These include items such as communication, interpersonal competencies, business acumen, and leading people and change, among others (Office of the Secretary of Defense, 2008). Regardless of service or career field, all personnel are expected to be adept in these areas. And throughout the five mission sets in this research, business acumen and process improvement were seen as KSA that were not being taught well enough or at all. The Air Force should focus on ensuring all 21X officers (and possibly all Air Force officers) have an avenue to learn these critical skills. Since these KSAs span across all mission sets, courses should be developed or altered to include this in the curricula. The course should include practical and real examples of how these skills have been used in the past, and the benefits gained from them. As stated by several interviewees, the Air Force may not be as resource constrained today if its personnel was already adept in process improvement. And the value of business acumen, according to participants of this study, is being able to see problems, critically think and analyze them, and then solve them and lead change. By ensuring the 21X career fields have an avenue to learn these skills, the Air Force may

find itself better prepared to be successful in the face of the challenging logistics environment. One such avenue that may be beneficial in fulfilling these requirements is the Air Force Institute of Technology (AFIT) Masters and PhD degree programs. Not only do these programs cover relevant logistics and supply chain management topics to include business acumen, analysis techniques, and process improvement, AFIT is highly recommended by the interviewees in this study. Overall, 37 percent of the interviewees stated they would recommend an AFIT degree to their company grade officers. Based on this, I recommend the number of AFIT slots be increased to give more logistics officers the opportunity to learn these critical skills.

To address the other KSAs that were revealed as lacking in this study, an analysis needs to be performed to determine if those KSAs are adequately covered in technical school, CFETPs, or other offered courses. If not, those KSAs need to be added as soon as possible. In the case of information management, which is included in the CFETP, it may fall on the officers themselves to ensure they are getting trained adequately on the applicable systems. This is an area where 21Rs may need to look at themselves in the mirror and decide to do their part. After all, if they are signed off on those tasks in the CFETP, one should reasonably be able to assume that person is knowledgeable in that area. Perhaps more stringent controls need to be put in place at base-level to ensure officers are actually trained before they are signed off on those tasks.

To take advantage of the vast amount of overlapping KSAs in the mission sets, DoD and AF logistics courses should be reviewed and tailored to ensure they are not duplicating efforts. This makes good business sense because of the current fiscal environment and looming sequestration. Having one course teach what many are

currently teaching not only would save money, but it would provide one forum for officers of different backgrounds and career fields to come together. This would serve dual purposes of training/educating personnel, and it would also allow cross-talk which could lead to a deeper understanding of other career fields and mission sets. It could help one understand the interrelating pieces of the Air Force logistics world and how each one's actions affects the other.

Finally, several interviewees discussed the issue of young 21X officers deploying in a joint environment and not being prepared. For Air Force logisticians to become more adept in the Joint Logistics mission set, focus needs to be placed upon it early in a 21X officer's career, and it should be done in several phases. First, 21X officers should get an overview of the Air Force's role in Joint logistics in their initial technical school training. This training should include the KSAs discovered in this research. It should also provide an overview of our sister service roles and how to interrelate with them. To address the problem of young 21X officers deploying to joint environments unprepared, the benefit of a multi-service pre-deployment course should be investigated. This would be a course where more advanced topics are discussed, Joint Publication 4.0 would be heavily analyzed, and indoctrination into each service's culture and organizational capabilities and interoperability would be covered. This course would be attended by members of every service. Additionally, the Air Force should send as many of its logisticians as possible to courses such as Army Logistics University's Joint Logistics Course, which is for the rank of Major and above. The findings of this study make it clear that Joint knowledge and experience must happen early, and the above initiatives would better prepare the 21X officers for the Joint environment.

Limitations

This research is limited in several important aspects. First, only the traditional Air Force LRO mission sets of Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics were investigated. The proposed mission sets of Repair Network Integration and Mission Generation were not included. A comparison between this research and the research performed by Capt Thompson (2013) should be performed in order to fully understand the implications across the entire 21X community. Additionally, the interviews and focus groups were comprised of mainly 21A and 21R practitioners. Only a handful of Munitions Maintenance Officers (21M) participated in this study. This limits the transferability of the research, and it may not be applicable across all 21X career fields. Next, time constraints became a critical limitation of this study. Because of the limited time available, the importance of a KSA to a particular mission set was not investigated. Time constraints also precluded the investigation of when a 21X officer needs to learn a particular KSA. Although the researcher attempted to include representation from the entire population of 21X officers, time and fiscal constraints limited the number and geographic location of installations that could be visited. No overseas locations were explicitly included in this study; however it is assumed the participants are representative of the entire population based on experience and prior duty assignments. A large sample survey should be conducted to validate the findings of this research, discover the importance of a KSA and when it should be learned, and to ensure the results are representative of the entire 21X career field.

Future Research Opportunities

There are several opportunities to extend this research, both inside and outside the Air Force. The findings of this research can be analyzed in conjunction with the findings of Capt Thompson's (2013) research on the traditionally Aircraft Maintenance Officer mission sets of Repair Network Integration and Mission Generation. An analysis of all seven A4LF proposed mission sets and their respective KSAs for 21X officers could be performed. Because of the limitations addressed in the section above, a large sample survey would be useful to validate the findings of this research, to determine how important each KSA is to a mission set, and to determine when each KSA should be learned. This would provide more useful findings to A4LF in developing a deliberate development program for 21X officers. An analysis of the DoD Logistics courses offered could be performed to determine if the KSAs discovered in this research are covered. If the KSAs are covered by multiple courses, a consolidation plan could be developed. Additionally, if the KSAs are not covered, curriculum could be shaped to include them. Finally, a comparison of the proposed mission sets and KSAs could be made with sister service mission sets and KSAs to highlight opportunities for cross-service learning and understanding. The findings could be used to further shape DoD HCS initiatives.

Summary

Today's Air Force logisticians are operating in a rapidly changing logistics environment. In the face of these changes, the Air Force must deliberately grow multi-faceted, interchangeable Logistics Officers capable of succeeding across all applicable mission sets without sacrificing depth of knowledge. Through the use of interviews,

focus groups, and qualitative content analysis, the mission sets of Deployment, Distribution, Materiel Management, Life Cycle Logistics, and Joint Logistics have been validated through this research effort. Additionally, the critical KSAs needed within each mission set and their overlap have been identified. The Air Force can take advantage of this overlap by consolidating redundant courses that have overlapping KSA content, and by restructuring others to include any KSAs not being taught. Because of the current fiscal climate and resource constraints, the Air Force must do a better job educating and training its logisticians in business acumen and process improvement. In doing so, Air Force Logistics Officers will be better equipped to mitigate the effects of the environment and persevere during this challenging time.

Appendix A. Parent and Sub-KSAs According to Blind Review

1. Acquisitions
   a. acquisition
   b. Acquisition Milestones
   c. acquisition processes
   d. DOTMILPDF
   e. Experience in one or more areas of the life cycle
   f. Introduction of a new item
   g. Make ACQ 101 mandatory
   h. Procurement
2. Adaptability
   a. Adapt to Change
   b. Flexibility
   c. Adaptive Planning
3. Aerospace Planning
   a. AEF Concept
   b. AEF Next
   c. AEF process/program
   d. Agile Combat Support
   e. expertise MAF logistics
   f. MAF deployments (Strat, Tact, Tanker)
4. Air Cargo Procedures
   a. Air Drop
   b. Aircraft Loading
   c. country clearance
   d. Load Planning
5. Air Trans
   a. Air Drop
   b. Aircraft Loading
   c. country clearance
   d. Load Planning
6. Aircraft Generation
   a. Generation Flow Plan
   b. Phase I
   c. Phase II
   d. Phasing
7. Analysis
   a. Analysis Tools
   b. analytical statistics
   c. Analyze Fleet
   d. CANN rate
   e. Charts
   f. Condition Analysis
   g. Health of Fleet

h. modeling
i. Models
j. Ops Research
k. quantifying
l. quantitative measurements
m. reliability/maintainability
n. reports
o. statistics
p. trouped capacity

8. Asset Management
   a. asset knowledge
   b. asset mgmt
   c. asset visibility
   d. Bench Stock
   e. Ensure good visibility of parts
   f. Fill Rates
   g. inventory
   h. Inventory Management
   i. Inventory of assets (acft, ships, tanks, etc)
   j. Kit Fill Rate
   k. mission support kits
   l. Not Abusing soppy system
   m. Parts
   n. property books
   o. supply accounts
   p. Supply Priorities
   q. warehouse/inv. Mgmt

9. Base Support and Expeditionary Site Planning
   a. Base Support Plan/ESP
   b. Basing
   c. beddown planning
   d. BSP Training
   e. In-Garrison Expeditionary Site Plan

10. Business Acumen
    a. admin skills
    b. analytical reasoning
    c. business & government
    d. business ethics
    e. Business Govt
    f. business law
    g. business mgmt
    h. business strategy
    i. business/mgmt/comm skills
    j. Coordination
    k. Critical Thinking
    l. decision making ability

    m. economics
    n. general admin
    o. General Business admin
    p. innovation
    q. managerial control
    r. Marketing Mgmt
    s. micro econ
    t. management abilities
    u. most efficient way to manage
    v. negotiating skills
    w. organizational skills
    x. Plan
    y. prioritization
    z. problem solving
    aa. Program Mg
    bb. public relations
    cc. Resource Allocation
    dd. Review Business Models of successful "profitable" business
    ee. Risk Management
    ff. risk taking
    gg. Situational Awareness
    hh. strategic focus
    ii. thinking outside the box
    jj. time management/delegation
    kk. Timelines

11. Cargo Deployment Function
    a. CDF Processes
    b. PDF/CDF

12. Cargo Movement
    a. Cargo
    b. cargo handling procedures
    c. Cargo Movement
    d. commercial cargo processes
    e. Configuration (i.e. "Spoke", "Straight Line"
    f. Gnd/Air Transportation
    g. Ground infrastructure
    h. inbound freight
    i. land sea
    j. material handling
    k. Movement of Haz classes
    l. Multimodal Trans
    m. Other Trans Modes
    n. outbound freight
    o. processing cargo
    p. Traffic Management Office
    q. traffic mgmt

  r. Transport/Traffic Mgt
  s. trans logistics
  t. trans mgmt
  u. transportation
  v. Transportation & International Logistics
  w. transportation and logistics
  x. Transportation modes--other than air
  y. Transportation Network (Civ and Mil)
  z. Transportation Resources

13. Classes of Supply
  a. Army supply categories
  b. Class of Supply

14. Communication
  a. be able to explain things across each service (lingo)
  b. Briefing skills
  c. communication
  d. EXORDs, etc
  e. Foreign Language
  f. interfacing
  g. Interpersonal Com
  h. interpersonal relations
  i. oral communication
  j. PPT skills
  k. publish priorities to field
  l. Terminology
  m. Written Communication

15. Contracting
  a. Basic contracting
  b. Contract regs
  c. Contract Timing
  d. contracting
  e. contracting knowledge
  f. contracting skills
  g. Contracting/Acquisition
  h. contracts
  i. Engineering contracts
  j. Establish Contracts
  k. Host Nation Support
  l. procurement
  m. procuring vehicles
  n. purchasing

16. Customer Service
  a. customer service
  b. customer relations

17. Deployable Skills
  a. ADCON/OPCON at deployed Location

     b. ADVON

     c. CAF unit Deployment

     d. Combat Skills appropriate for deployment (such as convoys)

     e. deployed jt logistics

     f. jointness

     g. Warfighting

18. Deployment Operations - Site Surveys

     a. Bare Base Requirements

     b. BEAR

     c. Site Planning

     d. Site Survey

19. Disposition

     a. Backorders

     b. delinquent document & rejects

     c. Demil

     d. disposal

     e. Disposition

     f. Equipment Retirement

     g. Obsolescence

     h. retrograde

     i. return goods (PQDR)

     j. return goods handling

     k. salvage

     l. salvage disposal

     m. salvage/ simp disposal

     n. salvage/scrap

     o. salvage/scrap disposal

     p. salvage/scrap mgmt

20. Enterprise Logistics

     a. ability to interact w/outside

     b. agencies like DLA/AFPA

     c. Demand Management

     d. DLA

     e. DLA disposition

     f. DLA distributer orientation

     g. DLA processes

     h. DOT

     i. enterprise view

     j. GLSC

     k. GLSC/DLA/Organic Integration

     l. item manager

     m. JSTC capabilities

     n. retail logistics

     o. Source of Supply/ALC

     p. Surface Deployment and Distribution Command

     q. TRANSCOM

       r.   TRANSCOM process

       s.   understanding how other agencies do logistics (like dept of state)

       t.   wholesale logistics

       u.   Wholesale vs Retail

21. Equipment Management
    a. allowance sources
    b. Equip Prep
    c. Equipment
    d. equipment accountability
    e. equipment mgmt

22. Flightline Operations
    a. flightline procedures

23. Forecasting
    a. demand forecasting
    b. Forecast
    c. Forecasting
    d. Forecasting Availability

24. Fuels Management
    a. Fuels
    b. fuels knowledge
    c. Parts Availability
    d. Spill Response (Fuels)

25. Funding
    a. accounting
    b. budget
    c. Budget Codes
    d. Budget Management
    e. CAM
    f. Colors of Money
    g. Cost Effectiveness
    h. fight for money
    i. finance
    j. Money
    k. POM
    l. POM/PEM
    m. Pots of Money
    n. POTUS budget
    o. PPBE
    p. Program Objective Memorandum
    q. programming/POM
    r. Resource Management
    s. TWCF
    t. WCF/APN

26. Governing Documents
    a. AF doctrine
    b. AFI 23-101

  c. AFI 23-110
  d. AFI 63-101
  e. army doctrine
  f. doctrine
  g. DTR
  h. JFTR
  i. Joint doctrine
  j. log related regulations
  k. logistics regs
  l. National Strategy
  m. official travel regs
  n. regulation knowledge
  o. regulations
  p. regulations/IDO knowledge
  q. ROEs
  r. TCTO/TC
  s. title 10 law
  t. trans requirements and laws

27. Household Goods
  a. Household Goods

28. Industrial Engineering
  a. facilities
  b. facilities location
  c. Industrial Engineering
  d. industrial plans
  e. insurance/real estate

29. Information Management
  a. overall IT skills
  b. AFEMS (Air Force Equipment Mgt System)
  c. AFEMS/SBSS
  d. Automated Data Systems
  e. basic deployment sys knowledge
  f. Classified Mgmt
  g. CMOS
  h. CMOS, GATES
  i. computer jock
  j. computer science
  k. computer skills
  l. D200 computations
  m. DCAPES
  n. DCAPES Course
  o. DEERS/SORTS
  p. Deployment Systems
  q. ECSS
  r. Electronic Commerce
  s. GATES Training

      t. GATES, SMS, CMOS, GTN,
      u. GDSS
      v. Global Force Management
      w. GO81 Knowledge
      x. integrated deployment sys
      y. information management
      z. Information Systems
      aa. information systems mgmt
      bb. IT
      cc. IT Systems
      dd. ITV
      ee. JDPAC
      ff. Joint Operations Planning and Execution System
      gg. Joint Planning System
      hh. joint systems
      ii. JOPES (basic knowledge)
      jj. JOPES, DCAPES, LOGMOD,
      kk. JOPES/DECAPES
      ll. Log systems
      mm.   logdet, logfor etc
      nn. Logistics information mgt
      oo. LOGMOD
      pp. LOGMOD Course
      qq. LOGMOD skills
      rr. Mng Multiple Sources Info
      ss. network dynamics
      tt. PPT skills
      uu. SBSS
      vv. supply systems
      ww.   Systems (D200)
      xx. systems knowledge
      yy. transportation systems
      zz. Virtual Fleet
30. Installation Deployment Planning
      a. building DSOEs
      b. DCC mgmt
      c. Deployment Planning
      d. IDO Course
      e. IDOC
      f. IDP
      g. In-Processing
      h. Installation Deployment Plan
      i. installation functional knowledge
      j. Mobility Deployment
      k. Out Processing
      l. Phase I

      m. Phase II

      n. Plan

      o. planner (CWPC)

      p. planning

      q. pre-deployment tasks

      r. Reconstitution

      s. redeployment

      t. Redeployment Processes

      u. Regeneration

31. International Logistics
    a. international affairs
    b. international customs
    c. International Logistics
    d. international regs
    e. International Transport Requirements

32. Leadership
    a. approachable
    b. assertiveness
    c. confidence
    d. decision making
    e. delegation
    f. easy going
    g. leadership
    h. Leadership skills
    i. mentor
    j. Motivate Others
    k. people skills
    l. personal creativity
    m. Personal Integrity
    n. supervise others
    o. time management/delegation
    p. train/mentor
    q. training abilities

33. MICAPs
    a. MICAPS

34. Mobility Operations
    a. DDOCs
    b. Maritime Prepositioned Force
    c. theater distribution

35. Munitions Management
    a. Global Ammunition Control Point

36. Packaging/Crating/Palletizing
    a. packaging
    b. Packaging/Crating
    c. Packaging/DOT

37. Personnel Management

a. battle rosters
b. Civilian Relations
c. Civilian Workforce
d. Human Relations Management
e. Human Resources
f. labor relations
g. maintenance, learning from their level
h. manning and equipment
i. Manpower
j. Personnel Management
k. title 10 law
38. Personnel Movement
a. Passenger Management
b. PDF Processes
c. PDF/CDF
d. Personnel Movement
e. Personnel Prep
f. personnel processes
g. processing passengers
39. Plans Management
a. All aspects Planning
b. CAP-Crisis Action Planning
c. COMDES
d. contingency planning
e. CQCP Course
f. crisis management planning
g. CWPC (Planning)
h. Deliberate Plans
i. deliberate/CAP/Planning
j. deployment planning
k. desperate/crisis action planning
l. Employment of Force
m. Forecasting (sending best aircraft based on depot/phase/ISO
n. Functional Demands
o. future threats/ops
p. global/reg planning
q. Joint Planning Skills
r. Material Requirements Planning
s. MEP
t. National Strat Plan
u. O Plan creation
v. O Plans
w. Oplan interpretation
x. OPLANS/OPORDS
y. plan/organize
z. plan/oversight

aa. planning
bb. planning 101
cc. Plans
dd. Regional Planning
ee. Requirements vs. Capability
ff. sustainment planning
gg. trans planning
40. Port Management
a. Aerial Port
b. APOC
c. JTF - PO
d. MAPOC
e. Port Management
f. Port Management (Surface/sea/air)
g. Port Operations
41. Process Improvement
a. afso 21
b. constraint Management
c. CPI Lean
d. deputy processes
e. Efficiency from head to tail
f. First Article Test RCM for # of items
g. lean
h. Process (Acq 101, etc)
i. Process Improvement
j. process mgmt
k. Product Improvement
l. product quality
m. Some Systems Engineering
n. streamlining processes
o. Theory Of Constraints
42. Production Management
a. Production mgmt
43. Readiness
a. ART
b. ART/SORTS
c. Doc Statement
d. DRRs/Sorts/ARTs
e. readiness
f. readiness reporting like ART/SORTS/DRRS
g. SORTs/ARTs/DRRs
h. Squadron Readiness/Trng
i. UDM Course
44. Repair Cycle
a. Acft parts availability
b. Component Repair

  c. depot
  d. depot level repair
  e. depot processes
  f. Depot Support
  g. DIFM
  h. DIFM Rate
  i. Experience in one or more areas of the life cycle (test, ops, sustainment, acquisition)
  j. IREP
  k. MSG-3 (Maintenance Steering Group-3)
  l. Parts
  m. Parts & Service Support
  n. Parts Support
  o. parts/service
  p. parts/servicing
  q. PDM Cycle
  r. Repair capability assessment
  s. Repair Cycle
  t. reparables
  u. sustainability
  v. Sustainment
  w. sustainment strategy
  x. Tail Number Bins
45. Requirements
  a. Acft Structural Integrity Program
  b. Commonality
  c. Interoperability
  d. Modernization
  e. Modification
  f. Reliability Engineering
  g. Requirement Determination
  h. Requirements Definition
  i. Service Life Extension Programs
46. Research and Development
  a. Engineering
  b. Experience in one or more areas of the life cycle (test, ops, sustainment, acquisition)
  c. Research and Development
  d. Testing
47. Safety
  a. AFOSH Standards
  b. HazMat
  c. HAZMAT regs
  d. safety
48. Scheduling
  a. Production Scheduling
  b. Scheduling
49. Service Culture/Org Capabilities

a. Capabilities
b. culture
c. Executive Agency
d. inter-service perspective
e. joint service knowledge
f. know rank structure and service customs
g. knowing the seams
h. log mgmt of other services
i. Mission Statements
j. non-AF logistics functions
k. org structure of other services
l. other service log ops
m. personnel mgmt of other services
n. rank and power
o. ranks
p. relationship building
q. service knowledge
r. Service specific
s. services capability
t. sister service knowledge
u. Sister Service Processes
v. Sister Service Systems
w. Standardization
x. Structure
y. Uniforms
z. unit organization terms
50. Shelf Life Program
a. shelf life
51. Sister Service Interoperability
a. ALOCs
b. create joint efforts
c. DDOCs
d. Integration
e. Integration skills
f. interagency ops
g. Interoperability (Assets)
h. interoperability
i. Logistics Operations Centers
52. Sourcing
a. Diminishing Manufacturing Sources
b. manage supplier relations
c. Manager/supplier relations
d. Order Management
e. ordering
f. Parts Provisioning
g. parts sourcing

h. requisitioning
53. Stock Control Processes
    a. Adjusted stock levels
    b. inventory balancing
    c. leveling
    d. readiness base level
    e. stock allocation/authorization
    f. Stock Control
    g. Stock Levels
    h. Stock management
    i. Stock positioning
54. Support Agreements
    a. Host Nation Support
    b. support agreement training
55. Systems Engineering
    a. Systems engineering
56. TPFDD Management
    a. Day-to-day tasking mgmt
    b. TPFDD
    c. TPFDD knowledge
    d. TPFDD Mgmt
    e. TPFDD Planning
    f. TPFDD, CWPC
    g. TPFDDL/DSOE flow
57. UTC Management
    a. ULN Requirements
    b. UMD (Task)
    c. UTC
    d. UTC capability
    e. UTC Mgmt
58. Vehicle Management
    a. Fleet mgmt
    b. Vehicle mgmt
    c. vehicle ops and management
    d. vehicle utilization
59. Warehouse Management
    a. Warehouse
    b. warehouse management
    c. warehouse/inventory mgmt
    d. warehousing
    e. warehousing inventory
    f. Warehousing Mgt
    g. warehousing procedures
60. WRM Management
    a. Nuclear WRM
    b. WRM

c. WRM program
d. WRMO Training

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Vita

Captain Matthew D. Roberts graduated from West Jefferson High School in Harvey, Louisiana. He entered undergraduate studies at Southern Illinois University where he graduated with a Bachelor of Science degree in Industrial Technology in December 2004. He was commissioned through the USAF Officer Training School where he was recognized as a Distinguished Graduate.

His first assignment was to Little Rock AFB, Arkansas as a Communications and Navigations Systems Specialist in July 2000. He served in various capacities culminating as Integrated Avionics Quality Assurance Inspector. In July 2006, he was assigned to the 6th Logistics Readiness Squadron, MacDill AFB, Florida where he served as Officer in Charge of Materiel Management Flight, Officer In Charge Deployments, and the Deployment and Distribution Flight Commander. Additionally, Capt Roberts was selected as the executive officer for the 6th Mission Support Group. While stationed at MacDill, he deployed to Afghanistan from June 2009 to June 2010 on an embedded training team as the senior logistics advisor for an Afghanistan Army Kandak.

In August 2011, he entered the Graduate School of Engineering and Management, Air Force Institute of Technology at Wright Patterson AFB, Ohio. Upon graduation, he will be assigned to Joint Base Langley-Eustis, Virginia.

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14. ABSTRACT
USAF Logistics Readiness Officers (LRO) operate in an evolving environment which necessitates growing multi-faceted LROs capable of succeeding across all mission sets. Because of this evolving nature, the knowledge, skills, and abilities (KSAs) needed in these mission sets may have changed. This study sought to validate the mission sets an LRO operates in, identify critical KSAs needed within each, discover overlap, and to determine if the KSAs are being adequately taught.   The problem was addressed through qualitative content analysis of interviews and focus groups comprised of logistics practitioners in the Air Force. Analysis led to validating Deployment, Distribution, Materiel Management, Life Cycle, and Joint Logistics as mission sets an LRO operates in. These mission sets are comprised of 60 critical KSAs, and 75 percent span multiple mission sets. The USAF can take advantage of this overlap by consolidating redundant courses that have overlapping KSA content, and by restructuring others to include any KSAs not being taught. Analysis also suggests the USAF must do a better job educating its logisticians in business acumen and process improvement. In doing so, LROs will be better equipped to mitigate the effects of the environment and persevere during this challenging time.

15. SUBJECT TERMS
    Logistics Readiness Officer, Aircraft Maintenance Officer, Logistics Officer, Logistician, Knowledge, Skills, Abilities, Mission Sets, Group Dynamics, Focus Group, Joint Logistics, Mission Generation, Repair Network Integration, Life Cycle Logistics

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